

The Week

HOME 1-5

Bristol senate defers cuts decision
12 per cent of poly graduates did
not find jobs last year
Malthus was right after all, says
Cambridge group
ACSET reduces PGCE cutback
NORTH AMERICA 6
Fulbright exchange programme
close to collapse
Reagan warned over science cuts
\$15.6m windfall for top nine
universities
Canada's biotechnology initiative
to help Third World

OVERSEAS 7
Hungarian campaign wins release
of imprisoned lawyer
Peking purge of "graduate
nepotism"
Turkish universities relax entry
requirements
Belgian rector highlights shortage
of permanent posts
Science "Great Debate" launched
in France

ARTICLES 8-12
The cuts and their consequences:
Ngilo Crequer reports on how
universities have responded to
the UGC letters, 8
John O'Leary discusses the DES
plan for an emergency national
body for polytechnics and
colleges, 9
Peter Hampshire discusses the
problem of subjectivity in
literary criticism, 11
Tim Robinson examines the
growing crisis in media studies,
12

ARTS 10
Basil Smallman discusses the
metaphors of music
commentators, and Richard
Gray describes Essex's first
Festival of Contemporary Arts

BOOKS 13-16
David Martin reviews *Unpopular
Education*, a critique of social
democratic attitudes to
education by Birmingham's
Centre for Contemporary
Cultural Studies, 13
Iain Wright discusses early Auden
(14), Harold Thompson reviews
a new study of Chinese science
(15), and Nevill Mott reviews
C.P. Snow's posthumous work,
The Physicist (16)

AMERICAN STUDIES 17-19
Edgar Allen Poe, colonial
America, President
Eisenhower, and General Grant
are among the subjects of new
books in American studies

NOTICEBOARD 20
CLASSIFIED INDEX 21

OPINION 26-28
Steven Lukes discusses two
disturbing cases of arbitrary
immigration control; Andrew
Pearmain of the NUS urges
universities to set sensible
priorities for austerity; and
Don's Diary from J. H.
Higginson, 26
Letters on the future of Bradford
University, and tenure for
university teachers, 27

Next Week
Richard Ross on Big Government
Peter Abbs on autobiography
R. I. Moore on witches
Overseas students: a worldwide
"Briefing"
New books in mathematics and
physics

Published by Times Newspapers
LIMITED, 1981
Printed by Times Newspapers, 200 Gray's Inn Road, London WC1X 8EZ, England.
Typesetting by ComputerGraphics, 37-41 Coppenham Road, London NW10 7JH.
Printed by W. & A. G. Barclay, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000.



HIGHER EDUCATION SUPPLEMENT
200 Gray's Inn Road, London WC1X 8EZ. Telephone 01-837 1234

Fudging a new concordat

The Government has dug itself into a deep hole over its policy on "full cost" tuition fees for overseas students. What seemed originally to be a short cut to a comparatively painless (by asking foreigners to pay more of the cost of British higher education), and politically innocuous (because it could be justified by nativist prejudice) reduction in public expenditure on higher education has in fact produced unforeseen and disastrous effects.

The first, and politically more significant, has been the opposition that "full cost" fees have provoked overseas, and in particular in the Commonwealth. Although the South African rugby tour to New Zealand and the Mugabe-Muldoon duel kept it off the formal agenda of the recent meeting of Commonwealth prime ministers in Melbourne, this policy has become the occasion of considerable grievance, particularly in those poorer countries which depended most heavily on Britain to provide higher education opportunities over and above those which could be provided at home.

This heavy sense of grievance shows no sign of disappearing. Malaysia, the largest single source of overseas students in British universities and colleges during the 1970s, now sends its students elsewhere and has recently adopted a new and tougher policy towards British commercial interests. Perhaps these two developments are not entirely unconnected. "Full cost" fees for overseas students were right at the top of the agenda when the President of Nigeria paid a state visit to London earlier this year.

A consequence of this hostile reaction overseas is that those Government departments concerned with foreign relations and trade have become increasingly unhappy with the DES's policy on overseas students. After all, heads of important African states are not meant to come to Britain angry about the arbitrary treatment of their fellow citizens who are students here. Such moods do not contribute to successful diplomacy, whether of the strategic or commercial varieties. In this way the Foreign Office, the ODA, and the Department of Trade have had to cope with the unpleasant "hang-over" effects of the DES's "cuts-at-a-stroke" policy towards overseas students.

Not so long ago those well-rehearsed arguments about trade following the students were gently pooh-poohed at Westminster and in Whitehall. They were often dismissed as self-serving arguments put forward by those who wished to escape from the full rigour of the new Government's policy on public expenditure or by the professional philanthropists of the aid lobby. Now such arguments are being taken much more seriously as the cost of the "sunk the foreigners" approach to overseas students is counted in a decline of affection for Britain and a loss of export potential. So within Government the ground is certainly fertile for the seed of a new and more moderate policy towards overseas students, provided someone can come up with one.

The second unforeseen effect of the policy of "full cost" fees has been to destabilize the Government's much more important policy of reducing the overall level of public resources committed to higher education. It has introduced an element of extreme uncertainty into a situation that is already highly volatile and disorderly because of the heavy cuts in the ordinary UGC grant, and so made a rational response to contraction from the universities very remote indeed.

Secondly, "full cost" fees have hit hardest some of the best institutions in British higher education. This may not be true in all cases but it will serve as an adequate generalization. The policy has particularly adversely affected science and engineering and has damaged the viability of some specialist institutions with world-wide reputations.

So if the Government's overall policy for higher education has been at all to protect the strong and excellent at the expense of the less strong and the less excellent, its detailed policy on overseas students' tuition fees has pulled in the opposite direction.

The result has been that in their inevitable effort to overcome this contrary bias agencies and institutions like the UGC and the Universities of London have been forced to discriminate ever more than would have been necessary if they had had to cope only with the reduction in the normal grant for home students. This has added to the misery of the disadvantaged, whether institutions or disciplines, and whether the policy has been one of "equal misery" or of selectivity.

Thirdly, and most obviously, the policy of "full cost" fees has introduced an extra element of discon-

'Self-regulation, informal quotas, gentlemen's agreements are not very heroic but they can be surprisingly effective'

omy into a system that is being precipitately forced to become more productive and more flexible. Overseas students after all often filled the places left empty by a lack of demand from British students. If they are priced out of the market and the arbitrary rules of the game do not encourage an institution to even try to fill any empty places with new types of home students, then the mismatch of supply and demand is made worse. This in turn increases the pressure to reduce the supply (of teachers, courses, buildings, equipment) more than is necessary, let alone desirable, with all its unpleasant consequences for redundancies and closures.

So the real effect of the Government's policy of "full cost" fees has been doubly disastrous. It has led to a significant and measurable deterioration in Britain's position overseas, in terms of political influence and of trade; and it has made it more rather than less difficult for the Government to achieve its overall objective of reducing public expenditure on higher education as a whole in a way that is even approximately planned and politically dignified.

The problem, of course, is what can be done next. The defects of the present policy on overseas students are so well known and so well admitted that a state of inertia seems almost to have been produced by this negative unanimity. The temptation therefore is simply to reply to the question "where do we go from here?" to answer that we should not start from here.

But we have to start from here. For there can be no retreat to the traditional position that, with, and so how many, students are to be admitted, whether from Britain or from overseas, are entirely within the discretion of the institution to which they have applied, and is not the business of the Government. This denial of any public policy

dimension to a question which clearly involved considerable public expenditure was never very logical, but it may have been sustainable if higher education had exercised discreet self-control, a self-imposed and informal quota if you like. But this was realized too late and too little action was taken to remove overseas students from the politicians' agenda - which was where the incoming Conservative government found it so and a half years ago.

So it is now impossible to return to this *status quo ante* and in any case the question of overseas students has been slowly edging its way up the policy agenda since the mid-1960s. It was not a sudden apparition of the mid-1970s. However, it might help if the universities, polytechnics and colleges could find ways to convince the Government, any government, that given a second chance at self-regulation they would not behave like the Bourbons but accept that the admission of overseas students was an academico-political issue not one starkly of institutional autonomy.

But even such a public change of heart would only influence policy in the longer term. It could do little to help the Government to clamber out of the hole which it has dug for itself (while, of course, admitting no change of policy). Perhaps the best way forward is two-fold. First, the Government should increase the number of scholarships and other forms of aid it gives to overseas students. This can be done discreetly and gradually to save political face but the eventual aim should be for a substantial proportion of overseas students in British higher education to receive some form or other of subsidy.

Secondly, the Government should agree to freeze the present level of fees for overseas students, a decision that would be well justified by reference to the international market for higher education places, while allowing home tuition fees to rise and so surreptitiously narrowing the differential. Finally, the Government for its part should accept that the question of overseas students is not simply a question for the market to resolve but one which has a powerful academic and public policy dimension, just as higher education has to accept that it is not simply a question of institutional freedom. Then we might have at least the seed of a new and more hopeful policy.

Only when both higher education and the politicians have accepted that the other side has a case on this tangled question of overseas students' fees can the basis for a new concordat be established. For that is what is required. The present "market" policy is as indefensible as the "academic" policy that it so abruptly replaced.

Sooner rather than later it has to be accepted that many interests are involved and that many principles are at stake in deciding both the total number of overseas students to be admitted to British higher education and the proper level of the fees which they should be charged. Academic freedom, the international quality of (in particular) the universities, of policy, the proper control and direction of public expenditure, all are mingled in this difficult issue.

So no clean and entirely logical solution is likely to be available. In the short term an expansion of scholarships and the freeing of tuition fees are probably the best that can be hoped for. In the medium and long term the most hopeful way forward is perhaps a return to the fudging of the late 1970s. Self-regulation, informal quotas, gentlemen's agreements are not very heroic but they can be surprisingly effective.

Laurie Taylor



Mummy?
Yes, darling.

Mummy. Is daddy unemployed?

That's a very long word for such a little girl. Now settle down and let me tuck you in nicely.

'Cos Mrs Williams, my headmistress...

Headmistress. She said we had to say a prayer for the unemployed...

Well, that's very silly of you, isn't it? Daddy works at the university, doesn't he? In his office.

Where that nice Doctor Swinerton gave you those barley sugars you didn't like.

But is he unemployed?

No, of course not. Why do you think that?

'Cos Mrs Williams said it was very sad being unemployed because you had to spend all day sitting around the house doing nothing and that was very sad and I said that my daddy sat around the house all day and looked sad.

Silly darling. He doesn't sit around the house every day looking sad, does he? And you see when he does he's not really sitting around the house. He's doing work at home, isn't he?

Will daddy be unemployed soon, 'cos Mrs Williams said that more and more people would soon be unemployed so we must pray very hard.

No, darling. Daddy won't be unemployed soon.

Why not, mummy?

Because... well because he's got "tenure".

What's tenure, Mummy?

It means that... erm... your daddy won't be unemployed.

Why not, Mummy?

Because... because... daddy has to have his job forever in case anybody tries to sack him for the wrong reasons.

But what about if they wanted to sack him for the right reasons?

Look darling. I don't know who you've been talking to at school, but you're becoming thoroughly spoilt. Now, big cuddly kiss and big sploody kiss. There. Night night.

Mummy.

Yes darling?

Mummy. Why doesn't every body have tenure like daddy?

Now listen, darling. You remember the other day when I told you that nobody knew where the earth came from? What did I say it was?

You said it was a mystery.

That's right. Clever girl. And that's what tenure is. A mystery.

And only God can understand it? Like the other mysteries?

That's right, my sweetheart. That's just about absolutely right.

The Times Higher Education Supplement

November 13, 1981 No 471 Price 45p

Deliberate closures preferable to bankruptcies, says Sir Keith

by Ngilo Crequer

Sir Keith Joseph hinted this week that deliberate closure of individual universities would be preferable to watching over random bankruptcies in 1983-84 because of the effects of Government spending cuts.

Sir Keith, who was making his first public statements about higher education since he became Secretary of State for Education also told MPs that student loans were not dead; the Robbins principle, though not dead, was redefined; and that the cuts would also raise standards in some disciplines.

Giving evidence to the Commons Select Committee on education he was asked how he would act if several universities went bankrupt in 1983-84, as they had said they might.

He said: "We would certainly deplete random closures, random bankruptcies, resulting from a failure of a university to adjust adequately, or by the failure of the dialogue between it and the University Grants Committee to prevent such an outcome and cope with avoiding it."

"But if it were the judgment of the UGC that over time it would be better for the quality and standards of higher education as a whole that something other than random bankruptcies should occur, Government would have to take that advice."

He said the price of the cuts was such that things "had to be that bit tighter" because of economic imperatives. "The use of the brake reflects

the previous use of the accelerator." Universities would have to make painful adjustments and "I should concede that in very limited areas indeed there may be something called damage."

He said he now had to study urgently the vice chancellors' proposals for a national redundancy scheme "but I shall have problems of substance and finance to consider and can make no promises whatsoever about extra money."

Mr Christopher Price, chairman of the committee asked if Sir Keith accepted that: "If universities do make anyone redundant they are liable to go bankrupt and if they do not make anyone redundant, they are also liable to go bankrupt."

"These two factors are highly relevant, and there are other factors," he said there were a number of different predictions about what might happen and it was his job to discover which were most likely to come true. There was a "labyrinth of variants."

Asked if the Government would claim back money if universities exceeded student targets, he said: "If they were to float the guidance of the UGC and the result emerged as higher costs on the taxpayer we would have to take this into account."

After saying that he was not contemplating the privatization of any universities he was asked about student loans. He pointed out that his

predecessor had recognized their merit, but not their practicability. "I recognize their merits. Whether a move towards student loans is practicable is certainly a question that is open."

But he did now wish to give a false impression about the speed with which they could be implemented or the extent to which they would cover costs. On student participation he said that perhaps higher education had expanded beyond what was justified in terms of the transmission of knowledge and the ability of the economy to sustain it.

After a confused discussion about the Robbins principle, when nobody could recall precisely the formula, he refused to say it was dead but "in effect it is being redefined by what is going on now."

He said that people who had not got university places had displaced some in the polytechnics, who had displaced others. "In the last year it appears that the maintained sector has increased numbers of students to a much greater extent than was expected... there may have to be a fall from that higher than expected number."

Asked if the cuts meant that in some cases there were opportunities to raise standards he said: "I would have thought there many parts which are quite excellent by world standards. In several, the result of what

continued on page 3

'Interim' body deal finalized

by John O'Leary

Local authority representatives this week reached final agreement with Sir William Waldegrave, under secretary for higher education, on the establishment of a new body to introduce national planning of colleges and polytechnics.

A draft statement was being agreed by the two sides this week for circulation to interested parties in advance of a formal announcement, which is likely to be made next week. It will contain only the bare outline of the new machinery, leaving the members to settle a number of important questions including the independent chairmanship of the second-tier board of officials.

The new body will be called the Interim Committee for Local Authorities Higher Education, the qualification of "interim" having been added at the insistence of the Department of Education and Science.

Although the DES would say no more than that this week's meeting had been fruitful, it is understood that the two sides have agreed to retain the exclusive membership proposed in the original outline. Only the Council for National Academic Awards is expected to be offered a role on the main body, with union and institutional interests joining the board of officials.

It has been accepted that despite delays in agreement of the size of the body will arrive by the end of the year. Its first priority, after the remaining details of its operation, will be to look again at course approvals in the larger in-



Polytechnic lecturer Brian Willington spent his time lying flat on his back with a slipped disc inventing a new kind of traction frame. Six months later he went back to Ward 10 at Hemlington Hospital, Middlesex, to present staff with a dozen tubular frames which are more compact and more easily adjustable. Mr Willington, a senior lecturer in the mechanical engineering department, is pictured (second right) with mechanical engineering students Charles Wright and Alma Marriott who built the frame and one of the first patients to try it out.

£8.75m satellite request refused

by Robin McKie
Science Correspondent

Resources for Britain to spend £8.75m on taking part in an ambitious international satellite project have been refused by the Science and Engineering Research Council. The surprise decision was taken despite the fact that the project's scientific excellence had been recognized by the SERC astronomy board's claim that the German Rosat project offered British scientists an "outstanding and unique opportunity" in the field of X-ray astronomy.

It is extremely rare for SERC board recommendations to be turned down by full council and the move indicates that in future big projects which could tie up council funds for several years could come under more rigorous financial scrutiny with preference being shown for short-term less ambitious research in the area of pure science and engineering.

But the astronomy board is not giving up. It is to resubmit its request

for resources for the Rosat project, scheduled for launch in 1987. In turning down the proposal, a move led by engineering board chairman Mr Desmond Downes, the council endorsed the project's scientific excellence but called for a closer examination of the implications of committing a large slice of council money over the next five years.

The council is particularly concerned that the astronomy board's funds are already stretched through its commitment to building an observatory complex at La Palma on the Canary Islands. By tying up funds through new international agreements, flexibility would be lost - a particularly dangerous development when the council could face more Government cutbacks.

However, the astronomy board has now prepared a paper to be presented at next week's council meeting which argues that £8.75m



Richard Rose
on 'Big
Government', 13
The worldwide
assault on
foreign students, 8
R I Moore on
witches, 14

A whole new ball game

Nothing it appears is sacred in the modern city. Even the Oxbridge traditions of the May Balls and the popping of champagne corks to greet students completing their examinations.

Police in Oxford have told the university professors to stop students spilling out of the examination schools in to the High Street to celebrate with champagne.

A senior officer said: "More and more people now turn up for these revels. The traffic is blocked at lunch time and tea time for four weeks every summer term. Students will now be moved on to their colleges."

At Cambridge the May Balls, almost 100 years old, will have to end at 1 a.m. instead of lasting all night; fireworks will be restricted to early evening and loud bands kept indoors. If it is not possible to choose "quiet hands", these regulations are contained in a new code of practice sent to all colleges by the university, and follow a deluge of complaints in recent years from city residents about noise.

A university spokesman said: "There were no problems with Victor Sylvester. But with Led Zeppelin it's a different ball game."

The university is keen to cooperate with the city. An appeal to cut down on noise from the vice chancellor last year was largely ignored. The balls are already under some pressure with most students unable to afford tickets.

Industry needs more PhD power

Industrialists should have more say in the choice of research carried out by post-graduate students, stricter controls on the supervision of students, and continued emphasis on research in universities over polytechnics, says a report being studied by the research councils.

The report contains major recommendations on reforming postgraduate research in the face of declining funds, increasing graduate unemployment, and low PhD completion rates mainly in social sciences.

But overall the report, produced by a committee headed by Sir Peter Swinnerton-Dyer, former vice-chancellor of Cambridge, says the country gets good value for its money. Comments from individual research councils are to be considered soon by the Advisory Board of the Research Councils.

The committee considers it essential that "user" interests - including industrialists - should be better represented on council postgraduate committees than at present. "We recommend that councils and user interests redouble their efforts to find suitable representatives."

The research councils should carry out through reviews of their postgraduate policies every four years and because small departments offer researchers less chance to mix and provide less access to full ranges of equipment, research councils should concentrate their awards in larger departments. It acknowledges that this would work against polytechnics in the allocation of normal quota awards.

However, the report expresses particular concern that over the past few years the Science and Engineering Research Council has allocated more research awards in engineering than there have been well-qualified applicants despite evidence that employers' demand for these post-graduates is very small. "New PhDs in engineering have no difficulty in getting jobs; but they seem to get the same jobs, at the same salaries, that they could have got three years earlier when they graduated," the committee states.

As a result the report concludes that the SERC "should not strain" to fill places in engineering research with the risk of sacrificing quality for quantity. "It would, however, seem worthwhile to make even more effort to attract first degree graduates in the 'pure' sciences towards engineering research projects," it adds. The report also suggests that there is a case to make research awards to experienced engineers from industry.

The report calls for major changes in the supervision and awarding of PhD degrees. All students are to be given a thorough grounding in research techniques as part of their training, and after one year face a detailed check to see if they are suitable for continuing the programme.

It urges far more contact between students and supervisors, additional outside supervision where possible, and regular checks on the quality of supervision. It suggests universities set up formal supervising committees to do this.

A radical

More cuts would close universities

by Ngaio Crecquer

Further cuts in Government grants to universities would probably lead to wholesale closures, the University Grants Committee has told MPs.

In answer to questions put by the Commons select committee on education, science and arts, the UGC said: "Further reductions would magnify the damage and the gap in resources which the university system is now facing, and it might no longer make sense to continue to distribute grants to all institutions on the committee's list."

Any university taken off the list would be bound to face closure as a high proportion of each university's income now comes from Government funds.

The UGC repeated its warning that universities which exceeded their home student targets might be penalized. Fees and grants were penalized, and the UGC said "... and we could not be confident that the Government would remain oblivious of the effect on the system of action by institutions which wholly disregarded UGC advice in order to increase their income through home student fees."

The UGC hoped, it said, that there would not be major disagreement on numbers. But if an institution wanted to admit more home students, the committee would ask whether the risk of the grant being reduced would justify introducing financial sanctions against the institution concerned, and whether the admission of students for fee income alone would lower academic quality.

When asked whether its concern

about universities exceeding student targets was based on academic criteria alone, it said it was anxious that students got a fair deal. If spending on fees and awards went up, causing the UGC grant to be reduced, it would be more difficult to achieve adequate academic standards, so they wanted to be cautious.

The UGC explained for the first time how it made its July cuts. Various options were considered, including reducing the number of institutions receiving grants; a tiered system with the top tier funded for research with others financed principally as teaching organizations; and equal percentage cuts to all.

All were rejected in favour of selectivity. The UGC decided a maximum 10 per cent cut in the unit of resource was all that could be tolerated. A cut of 5 per cent in student numbers would be needed, with a 15 per cent cut in staff numbers.

Its criteria included student demand, employment prospects, national provision of subjects, student mix (undergraduate and postgraduate: home and overseas), age of staff, expensive subjects, scarce subjects and small departments and research.

It assessed the national interest and adjudged that "as many as six student places in arts or social studies would have to be sacrificed to maintain one place in medicine ... one science and technology place lay between two and three arts or social studies places."

It estimated there would be a deterioration in the age participation rate from 73 per cent to 60 per cent until about 1990.



More than 100 works of art by students from universities, colleges and polytechnics went on show this week at the Whitworth Art Gallery, Manchester University, in the biennial Northern Young Contemporaries exhibition. Judges elected by student representatives selected the exhibits from almost 100 entries. After Vermeer, by Linda Schwab of Preston Polytechnic, was among six prizewinners, all of whom receive £100 from the Granada Foundation.

News in brief

LSE goes back to tradition

Student Social Democrats at the London School of Economics, who were in the van of the new party advance, were forced back to a choice between old-style Conservative, Labour and extreme left general secretary.

Former Social Democratic secretary Mr John Munford goes to resign in favour of all-roundism but not before the union will carry a vote of censure on his competence by 287 to 194.

The Social Democrat held its elections for next month's National Union of Students conference. The delegation, elected by single transferable vote, includes two Labour, one Conservative and one Social Democrat representatives.

Call for ballot at Cambridge

The Association of University Teachers in Cambridge is pushing for its own experts to be given access to the university accounts to assess the exact level of reserves. The AAT local association has also now formally called for a ballot of all lecturers on whether they approve the university's strategy to make £400,000 worth of savings and shed 10 academic posts over the next five years.

Poly polemics

Mr Christopher Price, MP, Mr Nicky Harrison, chairman of the Council of Local Education Authorities, and Dr Edwin Kerr, chief of the Council for National Academic Awards, will be among the speakers at a conference on *The Balance of Power in Higher Education* at the Royal Festival Hall, London, on December 11. It is to be organized by North East London Polytechnic in association with *The THES*. The fee will be £40 and details are available from the Information Office of NELP.

Invitation dropped

Students at Leeds Polytechnic have dropped plans to invite controversial psychologist Professor Hans Eysenck to lecture to them. A special meeting of the student union reversed an earlier decision to invite him following cancellation of a lecture on personality to the psychology faculty after a warning of possible disruption. In instruction to the student union executive to apologize for publicly criticizing the invitation was also rescinded.

Travel award

The chairman of the Scottish National Union of Students, Mr Neil Stewart, has won a travel scholarship for the best paper in public relations strategy. However, the course is communications at Aberdeen College of Commerce on which Mr Stewart won the award has now been axed as a result of Scottish Education Department cuts in postgraduate student grants.

Mexicans go home

Fourteen university rectors and education officials from Mexico finished a five-day British Council study tour yesterday examining higher education and research facilities in England.

Date for Sir Bruce

Sir Bruce Williams, director of the Technical Change Centre, and formerly vice-chancellor of the University of Sydney, will give the Charles Carter lectures at Lancaster University, on December 1, 2 and 3. His theme will be "A reconsideration of the ends and means in higher education".

Overseas students down again

by John O'Leary

Early enrolment statistics show a further decline in the number of overseas students, especially in further education. And official returns have now revealed that that poorest nations were already struggling to afford courses in Britain before full-cost fees were introduced.

First indications from the universities are that numbers from abroad are running near last year's levels, but still well down on recruitment during the late 1970s. Slight drops were reported by Imperial College, London, Dundee, Exeter, Leicester, Bradford, the University of Manchester, Institute of Science and Technology and Lancaster universities in the further education survey.

But the further education colleges, which were worst hit last year,

appear to be bearing the brunt of the reduction in numbers. A survey of 38 colleges carried out by Mr Paul Kingsbury, of Norwich City College, for the United Kingdom Council for Overseas Student Affairs, showed an average decline of 28.6 per cent total in enrolments.

Provisional returns are being collated by the University Grants Committee and the Department of Education and Science for a promised review of the impact of full-cost fees later this month.

British Council statistics for 1979-80 (the last year before full-cost fees) show a decline of 4 per cent over the previous year. But the figures for the poorest nations show a much sharper drop. Over four years their numbers dropped by 17 per cent while those from wealthy developing

countries increased by 33 per cent.

A further blow for those campaigning for a relaxation of controls on overseas students came this week in the form of a composite judgment on six cases dealing with the definition of Ordinary Residence, delivered in the Court of Appeal by Lord Denning, Master of the Rolls.

Although appeals by four students against the refusal of grants by their local authorities were rejected and two others upheld, the judgment altered again the criteria on which residence may be judged. Contrary to last year's ruling by Lord Justice Ormrod the three judges decided that no one whose right to remain in the United Kingdom is restricted by the Home Office can be considered "ordinarily resident".

Briefings, pages 8 and 9

Risk of clash with Catholics

The Government has decided to run the risk of direct confrontation with the Roman Catholic Church over the reorganization of teacher education in Belfast. The under secretary of state for education Mr Nicholas Scott has announced that the intention is to open discussions with interested parties on the basis of the interim Childer report with an explicit warning that if agreement cannot be achieved the Government will have to impose a solution.

The report, which was issued in June 1980, proposed that the two Catholic colleges of education, St Mary's and St Joseph's should merge to form a coeducational college and move to the site of the state-owned Stranmillis college. This would form a new Belfast Centre for Teacher Education along with Queens University, though with each college retaining its own legal and administrative existence.

While not formally accepting the report Mr Scott said it made sense and the Government was inclined towards it. At a press conference in Stormont Castle he emphasized the need for some form of reorganization since it made neither educational nor economic sense to have an annual intake of 600 students spread over six major institutions.

"We are not prepared to continue to subsidize uneconomic institutions when there are so many competing and socially desirable claims on our resources, both within the education service and beyond," he said.

Although alternatives to Childer have been put forward none seemed to offer the same advantages of academic strength and cost-effectiveness, he said. Mr Scott said the Government had no intention of forcing integrated education on anyone and the Childer committee posed no threat to the principle of voluntary denominational teacher training institutions.

But at the same time the Catholic church must adjust to changing circumstances and recognize its responsibility. The state paid 100 per cent of the running cost of the college. Since all parts of the education system are interdependent no one college has the right to demand a particular quota of students.

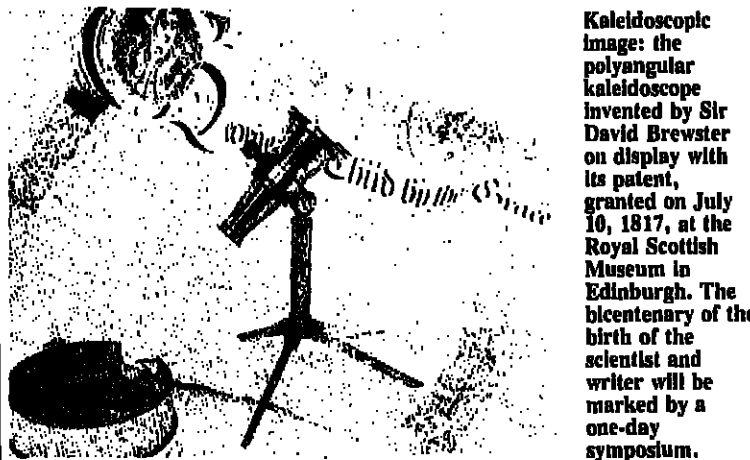
'Grave disquiet' at PCL

by David Jobbins

Senior academics at the Polytechnic of Central London have expressed grave disquiet at the present state of management of the institution.

The move follows last week's warning from the Inner London Education Authority that the polytechnic has only four weeks to draw up plans to eliminate a £200,000 deficit by the summer of 1983. ILEA auditors have been sent in to recommend ways of improving the situation.

Of the seven deans of schools five voted for the resolution, one against and one abstained in a resolution passed by the polytechnic's academic council. The council also protested that a freeze on recruitment of staff



Kaleidoscope image: the polytechnic kaleidoscope. Invented by Sir David Brewster on display with its patent, granted on July 10, 1817, at the Royal Scottish Museum in Edinburgh. The bicentenary of the birth of the scientist and writer will be marked by a one-day symposium.

Sir Keith and closures

continued from front page

is happening will be to raise standards.

Mr William Waldegrave, Under Secretary at the DES, has admitted he would have liked universities to have had more time to implement the cuts.

In a letter to Mr Norman Hogg, Labour MP for Dumbarthorshire East, he wrote: "Ideally we would have preferred not to have reduced expenditure on the universities or to have done so only after more time to review the needs of higher education and research ... inside and outside the universities."

Earlier this week Sir Keith had stonewalled attempts by vice chancellors to reduce the scale of the cuts or spread them over a number of years.

The Committee of Vice Chancellors and principals said after a meeting on Monday that Sir Keith "could not offer any relief whatsoever in relation to the financial cuts, and was adamant in insisting on the inevitability of a reduction in the opportunity for school leavers to enter universities."

"He recognized that substantial redundancies of university staff were unavoidable, and undertook to study urgently the proposals which had been made for financial compensation to those concerned."

Action stations

Student "beggars" were to be found slumped in doorways in the centre of Birmingham on Wednesday. They were from Aston University and among thousands of students taking part in a day of action.

could seriously affect academic work and expressed concern that the action had been taken so quickly and without consultation.

It earnestly requested the government to consult the council about the academic implications of any proposed action to deal with the financial polytechnic's finance and general purposes committee meets on Monday.

Three of the polytechnic's branches of the National Association of Teachers in Further and Higher Education and the institution's members of the National and Local Government Officers Association have passed no confidence votes in the rector, Dr Colin Adamson.

UMIST academic board opts for equal misery

by Ngaio Crecquer

The academic board at UMIST this week overturned the selectivity strategy proposed by its principal, Professor Robert Haszeldine, in favour of equal misery this session and restrictions on new appointments.

Professor Haszeldine wanted swinging differential department cuts and the creation of three new posts, against union opposition. Two of the posts had already been advertised.

But the academic board has recommended to council that for this session savings should be achieved, as far as possible, by natural wastage, early retirement and voluntary redundancy. It proposes that all departments should bear approximately equal shares on a percentage basis relative to their existing size.

No new UGC-funded appointments should be made, or vacancies filled unless this was essential to the continuing of the institute or unless the academic board approved the move by a two-thirds majority.

At Strathclyde, proposals which would axe 40 per cent of arts and social science jobs and merge four arts-based departments were thrown out by the senate.

Surrey University is to enlist the aid of the consumer industry in trying to avert closure of its unique home economics course. Its senate agreed to put off a final decision pending an appeal to the UGC for more funds. Other course closures recommended by a working party are to go ahead.

Surrey's council declared that compulsory redundancy should only be used as a last resort. In endorsing guidelines prepared by a joint policy committee it declared that income and expenditure should be brought into balance by 1982-4, and that only £2.6 million of reserves (approximately half the total amount) should be used to cover running costs, up to 1983-4.

London University vice-chancellor Professor Randolph Quirk is examining a possibility of some staff, teaching during the summer at the National

University of Singapore, which would contribute towards the salaries and ease the problems involved in a run-down of staff (details, page 4).

At Westfield College, London, a proposal that staff contribute towards savings by taking two weeks' unpaid leave, during which they would be able to use college facilities to make money elsewhere, has been accepted on a voluntary basis.

At Sussex the main spending units have been asked to propose ways of making savings of 15, 20 and 25 per cent. The Council has urged that schemes for generating extra income be implemented immediately.

Aston staff have been circulated with questionnaires asking them to consider a range of options for saving money, including the possibility of giving interest-free loans from their salaries.

Hull University senate approved a faculty of arts motion that drama and history of art should not be discontinued, contrary to UGC recommendations. It deferred a decision on its audio-visual centre.

It agreed that when it meets the UGC next month the university should stress the damage which would ensue if it had to reduce student numbers to 4,200 rather than a figure of 4,500 - 4,600 home and EEC numbers by 1983.

At University College, London a meeting of all staff was being held to oppose the cuts. The provost, Sir James Lighthill, who will attend the November 18 lobby, has agreed that 10 per cent of staff may attend without loss of pay.

At Manchester the senate accepted a motion that compulsory redundancy should not be considered until every other possible means of finding savings had been looked at. But a motion calling on university members not to cooperate in any redundancies was defeated by 47 to 52, with 19 abstentions.

Bedford College and King's College, London have produced draft proposals for a possible merger. In general they propose basing the larger sciences at the King's site, with the arts divided between the two. The earth sciences would go to the Bedford site at Regents Park.

Polys hit by PGCE cuts

by Patricia Santinelli

Polytechnics, and in particular the larger schools of education, appear to have suffered worse from the Postgraduate Certificate of Education cuts announced by the Government last week.

Cuts of 25 per cent in the 1982 PGCE intake were originally recommended to fall equally across the binary divide. But Sir Keith Joseph, Secretary of Education and Science, announced that the reduction would be only 20 per cent, to safeguard the viability of some courses.

On a small sample survey, however, polytechnics seem to have suffered a 23 per cent cut, while some

colleges have retained their entire provision.

For example, Trent Polytechnic has been reduced from 135 to 104 and limited to 23 on its primary course. Manchester Polytechnic has gone from 250 to 191 with its primary course quota of 30 limited to 16. North Staffs Polytechnic has gone from 100 to 72 and its primary has been limited to 16, while Matlock College has had no cut at all.

Meanwhile applications for 1983 PGCE courses are booming. The Graduate Training Registry reports this week that there is a 74 per cent increase in applications from 8,174 to 4,698 at the same time last year.

Deal worth £750,000 for micro firm

by Olga Wojtas

Scottish Correspondent

A company established by Heriot-Watt and Edinburgh Universities to promote microelectronics has been given Government contracts totalling £750,000.

Inmap (Integrated Micro Applications Ltd) will tap the expertise of Edinburgh's Wolfson Microelectronics Institute and Heriot-Watt's Computer Applications Services and aims to increase the use of microelectronics technology in Scottish industry.

Contracts have been signed with the Department of Industry and the Scottish Development Agency. Under the DOI contract, the company will run a series of seminars followed by opportunities for industrialists to meet expert consultants. The contract also provides for a permanent information centre on microelectronics-based products.

The SDA's complementary contract supports Inmap visiting 250 companies a year to assess how they might apply microprocessing techniques to their work.

Scottish Education and Industry Minister Mr Alex Fletcher, said Inmap offered a unique service, providing a vital bridge between industry and advanced technical thought.

"Its capability is strengthened by the world class skills to which it has access at the Wolfson Institute and Computer Applications Services, and Inmap will be able to look to other skills which exist elsewhere in Scotland - for example, software development at Strathclyde University - to achieve practical solutions to the practical problems of its clients," he said.

Scottish companies had not leapt forward to make full use of microelectronics, despite the paradox of a formidable concentration of companies which designed systems and manufactured components in the microelectronics field.

This was perhaps chiefly because of fear of the unknown and Inmap's first task would be "education and evangelism".

First class graduates lose PhD chances

by Robin McKie

Science Correspondent

A substantial number of graduates with first class science degrees were turned down for PhD studentships by the Science and Engineering Research Council this year - the second year this has occurred.

The trend, which is now causing concern among members of the council's subject committees, is revealed in figures for research studentships for the past four years.

In 1978 and 1979, no graduate with a first class honours degree in a science subject failed to gain a studentship grant. In 1980, 68 failed to get grants - a trend consolidated this year when 62 graduates were also unsuccessful.

Now poly fights art transfer

The governors of Leicester Polytechnic have voted unanimously to withdraw their backing for plans to close an art and design foundation course and transfer it to Loughborough College of Art.

Their about-turn came after the county's education sub-committee asked for a reappraisal of the scheme following protests from staff and students.

Staff on the course had been given guarantees about their job security. If the move went ahead, and there were fears this week that it did, the plan was dropped. The course would be a prime target in the round of cuts expected when the advanced further education pool is announced. It is the only non-advanced course at the polytechnic.

Merger principals deny quarrel

The principals of Bradford and Ilkley Colleges this week issued an unprecedented joint statement denying that the proposed merger of their colleges had led to personal animosity.

This followed reports that Mr Eric Robinson and Mr John Mackenzie, both members of a working party examining the reorganization of local higher education, had had sharp exchanges in committee over matters of policy and future management styles for the proposed institution. The statement says that while there were undoubtedly differences

Two major causes for this drop have been highlighted. Firstly the cut in resources which the SERC has been able to make available for postgraduate and secondly the rise in popularity of the council's other major postgraduate scheme - the Cooperative Awards in Science and Engineering which involve strong industrial involvement by students.

This popularity has meant that resources previously going to normal studentships have been taken by CASE awards, although students with first class honours tend to apply for pure science studentships.

This trend has been compounded by the fact that over the past four years, cash cuts inflicted on the council have also caused cuts in numbers of both forms of studentships. In 1978, there were 2444 studentships; in 1979, 2396; in 1980, 2311; and in 1981, the figure had dropped to 2250.

One of the major areas in which first class graduates found most problems was biological sciences. A total of 265 studentships were awarded, although 37 graduates with first class honours were successful. Only ten of these were successful in biological sciences alone.

A further 11 firsts who wished to take advanced SERC courses were eventually rejected but no first graduates who wished to do CASE awards projects were turned down in the end.

Adult sector under strain

Adult education is suffering intolerable strain as a result of relentless cuts in minuscule budgets, a survey of college and adult education centres revealed this week.

The survey by the National Association of Teachers in Further and Higher Education shows that the development of self-financing schemes, huge increases in fees, course closures, shortened courses, reductions in concessions for pensioners and cuts in part-time staff are continuing to erode the system.

Substantial fee increases are still having a significant effect on the take-up of adult education. Out of 92 replies to the survey, 85 per cent reported an increase in both vocational and non-vocational fees for 1981/82.

The worst cases were in Devon where fees for vocational courses more than doubled at Pilton Community College, and rose by more than 60 per cent for all courses at Okehampton Community College. In Hampshire non-vocational fees rose by half at Crickdale College, Andover and Eastleigh College of Further Education.

Large fee increases and problems with free trade arrangements caused a drop in student numbers at Barking College of Adult Education from 4,000 to 3,000 this year.

Pressure as Natfhe draws up pay claim

by David Jobbins

Lecturers' union leaders will draft their 1982 pay claim today amid conflicting pressures over the future of a flat rate element called for at their annual conference in May.

The National Association of Teachers in Further and Higher Education voted for a formula designed to reconcile the interests of lower paid college lecturers with those of polytechnic staff who saw their differential with the universities rapidly eroded.

The deal, forced on the leadership by insistent rank and file pressure for a flat rate component, was expressed in the formula $2x + y$ per cent.

But late last week the union's in-

fluential salaries advisory committee voted by a narrow margin to drop the flat rate proposal in the interests of maximizing public sector unity.

The recommendation will carry all the more weight with the executive when it meets today because the committee comprises activists from the regions who were likely to have been the strongest supporters of flat rate earlier this year.

But if the executive agrees to the advice, there will be tough resistance when the draft claim, expected to be 12 per cent in line with the other teaching and local government unions, is discussed in the country.

The argument, put forward during lengthy debate in the committee,

that the conference resolution should be adhered to, is to be revived by the left wing College Rank and File group within Natfhe.

"We will do our utmost to make sure the conference decision is implemented," a senior member of the group said. "This recommendation is blatant disregard of a conference decision."

But the effect of the recommendation is to underline that the climate has changed dramatically since May. Union leaders now recognize that internal unity, important though it still is, has to come second to wider agreement among public sector unions to stand together against the four per cent

cash limit for pay settlements.

They also feel that with the chances of a collapse of the Government's public sector pay policy virtually nil, settlements will not leave room for meaningful application of the $2x + y$ per cent formula.

Natfhe has already decided to speed up the process of finalizing its claim so that it can be lodged by Christmas.

Last May's conference resolution contained the caveat that public sector unity would be the overriding factor in the next pay round, and union leaders will undoubtedly point to this if they confirm the advice they have received and it is later challenged as a breach of faith.

Private cash spent by MRC

by Robin McKie
Science Correspondent

Inadequate compensation for tuition is now forcing the Medical Research Council to use its prize endowment resources to support a search that should be funded through its Government grant. In its annual report, published this week, the council reveals that over the period 1980-81, more than £500,000 had to be drawn from its private funds because the Treasury failed to set adequate cash limits to cover tuition.

The problem is particularly severe, the report adds, because prize fees on many laboratory instruments and chemicals are far outstripping the general level of inflation.

Although the MRC achieved a more stable financial position last year, because of new arrangements in pooling cash with the health department and the Overseas Development Administration, difficulties remain in supporting the best research. "This aim will be met only by rigorous cutting back on the scale of support made available to less productive research and by seeking improvements in 'housekeeping' across the whole range of the council's activities," the report adds.

The report also reveals that the MRC, following talks with the Association of University Teachers, has introduced new arrangements for employing non-clinical scientific staff. Previously three schemes had operated - short-term appointments of three years; limited term appointments for not more than five years; and unlimited, tenured appointments.

However, the system caused concern among researchers - particularly because of the inflexible rules in renewing short-term appointments, and the lack of open competition for unlimited appointments. As a result, the MRC has agreed to change its scheme. In future only short-term appointments will be offered - for up to five years, although occasionally six and tenured career appointments. The proportion of this last category will be increased from 67 per cent in the past to between 70 and 80 per cent of all non-clinical staff appointments.

The council is also to change its arrangements for funding research institutes which it jointly shares with the Cancer Research Campaign. In future the MRC will take over greater financial control of the Institute of Cancer Research in London and the CRC will take over the MRC commitments to the Beatson Cancer Institute of Cancer Research, Glasgow, and the Paterson Laboratories, Manchester.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbitt is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbitt is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbitt is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbitt is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbitt is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbitt is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

Glasgow may defy intake limits

by Olga Wojtas
Scottish Correspondent

The principal of Glasgow University has hinted that despite the university's fears that they will be penalized if they exceed set student-intake figures, Glasgow may not comply with the recommended reduction of 1,000.

Dr Alwyn Williams, speaking at a graduation ceremony, said the university would not meekly surrender its historic role of catering for school leavers from the west of Scotland.

Glasgow and Strathclyde universities had always had an extraordinarily high proportion of students living at home, said the principal, nearly six times as many as English universities.

"This difference has always saved the Treasury large sums of money," he said. "The annual notional savings on maintenance grants paid to home students compared with those who live elsewhere is about £1.75m for the University of Glasgow."

"This is enough to meet the full cost of training and maintaining an additional 400 students. We shall bear this discrepancy in mind when considering our future intake."

The extremely efficient system evolved by British universities for training students was now being dismantled in the crudest way by blinkered accountancy, he said.

It had not been merely a desire to

foster the finer things of life which had prompted the Robbins report on higher education 20 years ago, but a widespread anxiety that Britain was falling behind its chief competitors in providing suitably trained graduates in the professions, industry and commerce.

Since then, successive governments had funded a system which largely guaranteed a university place for every qualified school leaver. There was nothing especially generous about this practice, said Dr Williams, for it had served the country well in providing much-needed graduate expertise.

The loss of university jobs would contribute the merest trickle to the 3 million unemployed in the country, and Glasgow's 15 per cent cut in income was probably a great deal better than the losses within commerce and industry.

But it was nonsense having to shed staff when the demand for their services had never been so high, and cutting student places was scandalous when there had never been so many qualified candidates.

"The question is so senseless that one wonders whether there is now a prevailing view in Government circles that the country can have too much literacy and numeracy," Dr Williams said. "Our political leaders have a lot to learn about the husbandry of intellectual resources."

Talks held with Japanese on research collaboration

by Robin McKie
Science Correspondent

Detailed negotiations are being held by Britain and Japan on a series of collaborative research projects, it was revealed last week by Professor John Kingman, chairman of the Science and Engineering Research Council.

Field studies, followed by a trip to Japan by SERC officials led by the then council chairman, Sir Geoffrey Allen. Now a series of research programmes to be undertaken by universities and institutes in both countries are being considered in more detailed form.

Speaking at the presentation of the SERC's annual report for 1980-81, Professor Kingman said the joint projects being considered would be in the areas of space science, biotechnology and molecular sciences. In particular, space science which Japan intends to fund under an ambitious 20-year programme offers the best opportunity for British scientists as UK budgets in this area have been strictly rationed for the next four or five years.

Professor Kenneth Pounds, chairman of the council's astronomy, space and radio board, said the two major

fields of likely space involvement would be the areas of remote sensing satellite observation of Earth's resources and in space astronomy. Only in the latter field had there been any real progress he added.

The first likely project for mutual involvement would be the Japanese X-ray satellite project, known as Astro-C, which would investigate variations in bright X-ray sources. Britain would provide expertise through university groups and institutes in building detectors and supplying data analysis while only being required to put in relatively small amounts of money to the project - a few hundred thousand pounds - although the exact cost was still a matter for delicate negotiations.

If the project proved a success and Japanese and British scientists - despite different scientific working methods - could be seen to work together without difficulty, more ambitious and more costly joint projects could be set up - such as a plan to launch a major X-ray observatory, added Professor Pounds. This would be scheduled for the 1990s while the Astro-C project is planned for 1986.

Britain 'must spend more on vocation'

The principal of Robert Gordon's Institute of Technology has called for more money to be spent on high level vocational training to help Britain compete in industry.

Speaking at an RGIT awards ceremony, Dr Peter Clarke said British industry was reeling from disappointment to disappointment, and the real income from industry was decreasing.

Dr Clarke said that the Government must spend more on vocational training to help Britain compete in industry.

Speaking at an RGIT awards ceremony, Dr Peter Clarke said British industry was reeling from disappointment to disappointment, and the real income from industry was decreasing.

Dr Clarke said that the Government must spend more on vocational training to help Britain compete in industry.

Speaking at an RGIT awards ceremony, Dr Peter Clarke said British industry was reeling from disappointment to disappointment, and the real income from industry was decreasing.

Dr Clarke said that the Government must spend more on vocational training to help Britain compete in industry.

Speaking at an RGIT awards ceremony, Dr Peter Clarke said British industry was reeling from disappointment to disappointment, and the real income from industry was decreasing.

Dr Clarke said that the Government must spend more on vocational training to help Britain compete in industry.

Speaking at an RGIT awards ceremony, Dr Peter Clarke said British industry was reeling from disappointment to disappointment, and the real income from industry was decreasing.

Dr Clarke said that the Government must spend more on vocational training to help Britain compete in industry.

Speaking at an RGIT awards ceremony, Dr Peter Clarke said British industry was reeling from disappointment to disappointment, and the real income from industry was decreasing.

Dr Clarke said that the Government must spend more on vocational training to help Britain compete in industry.

Speaking at an RGIT awards ceremony, Dr Peter Clarke said British industry was reeling from disappointment to disappointment, and the real income from industry was decreasing.

Part-time art teachers join forces

More than 600 people attended a conference at Imperial College, London on the effects of Government cuts on part-time teaching in departments of art and design.

Organizer, artist Neil Bally, who paid for the conference with a £6,000 second mortgage on his London flat, has received £700 in donations and cheques are still arriving.

He said: "The issue is a matter of principle and not of personal material concern. I am undeterred by my financial crisis and have faith that it will be recouped." He teaches for seven and a half hours a week at Winbleton School of Art.

The conference brought together a teaching sector which has always been under-unionized, unrepresented at college, local or national level and is now threatened with virtual extinction.

At the two-day conference representatives of every major arts and educational body, union and political party, including several MPs, repeatedly voiced their concern at the detrimental effect on British art and design of the diminishing number of practitioners employed part-time.

Most speakers referred to what Liberal Party spokesman John Elsom called, "this policy of cultural bankruptcy", by which successive governments regarded art and design practice as peripheral to the real social and economic needs of the country. It was also, as James Piddich, chairman of Allied Industrial Designers pointed out, economic suicide as it was self-evident that thriving design departments were fundamental to any regeneration of British industry.

The current situation for departments of art and design is desperate. Cuts in part-time hours have averaged 25 per cent over the last two years, while full-time staff redundancies are under 10 per cent. In order to meet requirements for staff/student ratios, one in five full-time jobs or their equivalent in part-time hours must be lost by 1983.

So far, it has been easier to cut short-contract, part-time staff, with women often seen as the most dispensable. The nature of much art and design practice and the emphasis on studio teaching has led many part-timers to be unconnected with the major negotiating bodies of their professions.

Much of the conference expressed disaffection with the work of Natfhe, the major representative union. In particular there was concern about the associate lecturership scheme, which, although it provided job security for a few, was regarded by many as completely contrary to the idea of vitality and flexibility.

It was generally recognized that the large numbers of organizations and committees both professional and educational involved with art and design, had no coherent form of coordinating information or adequately covering the needs of part-time staff.

Poetry on show

J. P. Ward's exhibition *Sad Clowns of Word: verbal shapes and poetic objects* is on show until November 20 in the Main Library, University College, Swansea, not Aberystwyth as was stated on last week's arts page.

Unions prepared to talk on SSRC redundancy threat

by Paul Flather

The first signs of a possible break in the deadlock in the dispute at the Social Science Research Council over plans to reduce staff numbers by 13 emerged this week.

The four white-collar unions representing SSRC staff said they were prepared to open formal negotiations if the SSRC gave a prior commitment to avoid compulsory redundancies.

They will now ask the SSRC to clarify a statement in which the council appears to tone down its earlier demand that staff must be reduced from 159 to 146 by April 1983, before it agrees to talks.

The dispute blew up last month when SSRC staff picketed a council meeting complaining about the lack of consultation over the cuts and the increased work-load remaining staff would face.

Mr Jim Terry, divisional officer of the Association of Scientific, Technical, and Managerial Staffs, one of the unions involved, said the picture looked more hopeful this week.

Alternative to YOP by end of year

by Patricia Santinelli

The Government is poised to replace the overstretched Youth Opportunities Programme with a new scheme in which further education colleges and other institutions will play a key role.

Mr Norman Tebbit, Secretary of State for Employment, confirmed this week during the Queen's Speech debate on employment that he will announce such a programme, and the possible implementation of the other two parts of the New Training Initiative dealing with apprenticeship and adult retraining before the end of the year.

"I hope by the turn of the year to bring forward proposals for achieving all three objectives in the NTI, in particular through a comprehensive training system for the young unemployed," he said. "It is our intention that in the future young people should be given the opportunity to acquire a foundation of everyday working skills upon which specialist skills can be built."

He offered no details on how the new comprehensive education and training programme would be implemented but the broad outline appears to be that training, including job experience, will be available for all 16-year-olds. Training will take place in further education colleges and other educational institutions under the supervision of the Manpower Services Commission which will be largely responsible for administering the scheme.

Training will be more rigorous, of a higher quality and last longer than the present YOP provision. It is anticipated that the programme will last at least one year and will effectively deal with criticisms prevalent under YOP that many youngsters, especially under work experience schemes on employers' premises, were being exploited as cheap labour.

No details have emerged on how the programme or the other two objectives would be funded. There has been much argument since it was announced that the Government

should finance a major share of the new initiative and that arrangements should not be voluntary.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

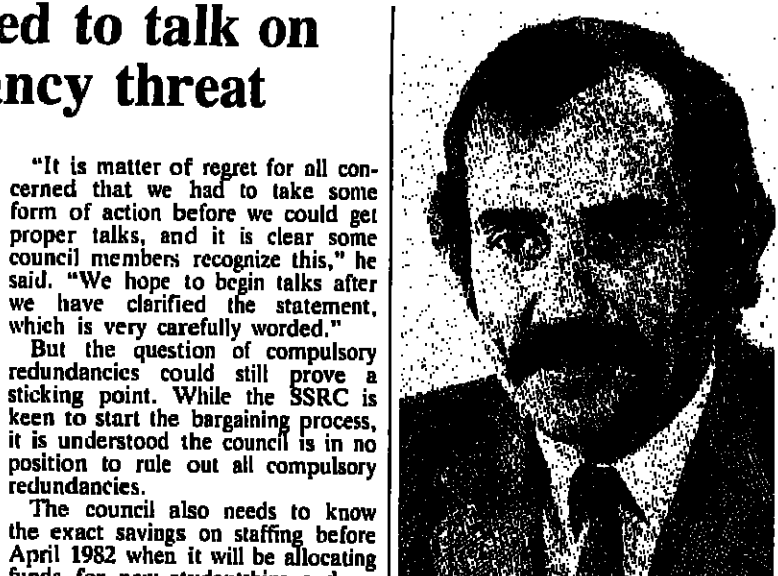
It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.



Professor Douglas Levin is to be the first holder of the Anglia Television Chair in Electronics at the University of East Anglia. Professor Levin, who is currently professor of digital processes and head of the department of electrical engineering and electronics at Brunel, takes up the post in January.

He offered no details on how the new comprehensive education and training programme would be implemented but the broad outline appears to be that training, including job experience, will be available for all 16-year-olds. Training will take place in further education colleges and other educational institutions under the supervision of the Manpower Services Commission which will be largely responsible for administering the scheme.

Training will be more rigorous, of a higher quality and last longer than the present YOP provision. It is anticipated that the programme will last at least one year and will effectively deal with criticisms prevalent under YOP that many youngsters, especially under work experience schemes on employers' premises, were being exploited as cheap labour.

No details have emerged on how the programme or the other two objectives would be funded. There has been much argument since it was announced that the Government

should finance a major share of the new initiative and that arrangements should not be voluntary.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

He offered no details on how the new comprehensive education and training programme would be implemented but the broad outline appears to be that training, including job experience, will be available for all 16-year-olds. Training will take place in further education colleges and other educational institutions under the supervision of the Manpower Services Commission which will be largely responsible for administering the scheme.

Training will be more rigorous, of a higher quality and last longer than the present YOP provision. It is anticipated that the programme will last at least one year and will effectively deal with criticisms prevalent under YOP that many youngsters, especially under work experience schemes on employers' premises, were being exploited as cheap labour.

No details have emerged on how the programme or the other two objectives would be funded. There has been much argument since it was announced that the Government

should finance a major share of the new initiative and that arrangements should not be voluntary.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

It is also expected that with the announcement of a new training programme, some decision will be taken on increasing the allowance of £23.50 which is being currently received by YOP trainees.

In its response to the New Training Initiative, the National Union of Students argues that the current YOP allowance is outdated and barely higher than supplementary benefit. It believes that training schemes should be publicly funded.

But Mr Tebbit is known to be considering the introduction of a training tax on companies on the lines of the Frency system. Under this scheme companies employing more than 10 workers have to pay the equivalent of one per cent of all workers' wages to the Government. The money is then used for apprentice training or given to any organization which needs it for training.

North American news

Leaked memo reveals 27% cut

from Peter David

WASHINGTON
Cuts even deeper than the 12 per cent announced last month by President Reagan may now be inflicted on the United States 1982 federal education budget, according to a private government memorandum leaked in the Washington press.

The memorandum, from education secretary Mr Terrell Bell to the budget's director Mr David Stockman, says that the administration's spending plans for later years could mean cutting the 1982 education budget by as much as 27 per cent. "I am convinced you are not aware of the magnitude of the budget authority cuts required to meet the budget outlay targets. Particularly it will be a shock to cut our 1982 appropriations request to a 27 per cent reduction when we are now struggling with cries of outrage from the education community over the 12 per cent cuts," says the memorandum.

According to Mr Bell, the deeper 1982 cut will be necessary to comply with a new 1983 budget target pencilled in by the Office of Management and Budget.

Because so many of the federal education programmes are forward-funded from one year to the next, a 27 per cent cut in 1982 would be needed to meet the education spending ceiling of \$11.4 billion imposed by the OMB for 1983.

The original 12 per cent cut announced by Mr Reagan last month would have reduced the education department's budget to \$12.6 billion in 1982. The OMB's 1983 target of \$11.4 billion would mean that total federal education spending would have declined by a third since the 1981 fiscal year.

The leaked memorandum reminds Mr Stockman that Mr Bell had spoken up in the cabinet to support the president's call for a 12 per cent reduction. "It now places me in a position of considerable embarrassment to find that my cuts are actually 27 per cent," it says.

The education secretary's embarrassment is matched by growing alarm in America's higher education community at the rate of contraction in education spending. The leaked memorandum reveals that the OMB wants education spending reduced again to \$8.9 billion in 1984.

To cope with the escalating cuts, Mr Bell has indicated to congress that the government's programmes of student grant and loan support will have to be severely curtailed.

In evidence to a congressional subcommittee, the education secretary argued that the Guaranteed Student Loan programme was causing "havoc" in the department's funding. In March, he said, the department had assigned \$1.8 billion, less than 14 per cent of its budget, to the GSL

programme. A few months later the programme had expanded to \$2.4 billion and more than 19 per cent of the budget.

Since giving evidence in Congress, Mr Bell has indeed moved rapidly ahead with plans to curtail both the GSL programme and the Pell grants programme - one of the major sources of income for American students.

New regulations introduced by the education department would make fewer families eligible for the Pell grants and freeze the maximum size of the grant at its 1981 level of \$1,670.

Similar restrictions proposed for the GSL programme have encountered strenuous opposition from higher education pressure groups. In a letter to the senate's budget committee last week, the American Council on Education argued that it would be an error to cut off eligibility for the GSL programme for families with incomes of \$40,000 or more.

Claiming that the measure could result in 500,000 students losing their eligibility for the loans, the letter says: "There are many reasons why families above this income have financial need: several children in college at the same time, unusual medical expenses or equally losses, or children attending higher cost institutions."

Emergency economies for California's universities

California's state universities will have to dismiss academic staff, eliminate some courses and increase student fees to comply with an emergency \$460m cut in the state budget announced by Governor Jerry Brown.

The state's two higher education conglomerates - the University of California and the California State University and Colleges have been told to trim their spending in the current financial year by 2 per cent each.

For CSUC this means finding \$20m of economies in the remainder of the financial year. UC will have to save \$22m.

In addition, Governor Brown has told the campuses to formulate their budgets for next year on the basis of another 5 per cent cut, which CSUC estimates will amount to another \$50m of savings.

The emergency budget was introduced to prevent a state deficit brought about by a combination of the recession in the United States economy, a reduction in federal aid to each state and the legacy of California's Proposition 13 in 1978 which cut property taxes by some 13 per cent.

But the regents and trustees of the two university systems have asked for urgent meetings with Governor Brown to complain that higher education is being asked to bear a disproportionate share of the cuts.

Mr William Baker, UC assistant vice president responsible for the university's budget, pointed out that most of the \$460m reduction ordered by the governor is to fall on capital expenditure programmes and only \$70m of recurrent spending. Of that \$70m, however, some 60 per cent of the cuts were being made in the two university systems.

Mr John O'Connell, chairman of CSUC's board of trustees, said that the outlook for Californian higher education was exceedingly bleak.

"The 2 per cent reduction imposed on the current year's allocations to California's four year and graduate level higher education institutions is unfair in that it is disproportionate,"

he said. "It amounts to 60 per cent of the entire burden of the \$70m emergency reduction programme announced this month by the governor. And it follows nearly 10 years of continual erosion of CSUC resources."

No staff reductions are envisaged yet at the University of California but a hiring freeze has been implemented and cuts in the university's administration and a reduction in enrolments are under consideration.

To meet next year's cut of 5 per cent, or some \$60m UC is to reduce programmes in some areas including health science and the professional schools. The aim would be to place out students and eventually displace with the relevant staff.

Echoing the thinking of British University Grants Committee, Dr William Freter, said that care would have to be taken to protect excellence within the system.

"If we must take further budget reductions on top of those absorbed in the past several years, our approach should be selective and not across the board," he said.

It is not only California's state universities which are facing financial difficulties, however. Stanford University, although private, is facing a \$3m cut in its 1982 operating budget amid mounting fears that the federal government's cuts in research funding will do substantial damage to the university's programme.

Stanford's provost said a fortnight ago that the federal government's plans for research funding were in a state of "considerable ambiguity" with some indications that Congress would balk at implementing all the cuts requested by the White House.

As a result, the university was assuming that its research funding would increase at a rate somewhat below the rate of inflation. A "research preservation fund" is being built up to protect research in threatened fields where the university is particularly distinguished, notably psychology and economics.

Sexuality course planned

Israel's medical students are very liberal about sex between men and women but highly conservative in their attitudes towards homosexuality, according to a study recently published by Haifa Technion, the city's institute of technology.

The study, conducted by a team of researchers headed by Dr Zvi Hoch of the Technion's faculty of medicine, found that not one of the female students in the country's four medical schools was a virgin when she began her studies. (Most female students enter university at 20, after completing two years of service in the Israeli defence forces, but some enrol at the end of high school.)

The researchers looked at 2,400 students enrolled in the medical schools of the Hebrew University of Jerusalem, the Technion, Tel-Aviv University and Ben-Gurion University and discovered that 5.4 per cent of the men had not had sex before they enrolled (usually aged 21).

Hoch's project was undertaken as part of a wider study upon which the Technion medicine faculty intends to base a new course on human sexuality, designed to suit "the needs and circumstances of the Israeli medical student."

The Israeli medical students were found to be extremely conservative regarding other aspects of sexual experience in comparison with their American peers. Only 9 per cent of the Israeli male students and 3 per cent of the female students admitted to having a homosexual intercourse at some point, and only 3.4 per cent had more than one such experience.

The study reports that 12.8 per cent of the female students had had at least one abortion for non-medical reasons. In general, the researchers discovered that the Israeli medical student knows far less about sexual matters than his American counterpart.

The university also intends to become more decentralized, so that its presence and influence can be felt in an increased number of countries and regions. For example it will call on the full academic and other resources of associated institutions.

The crisis facing scientific workers in Danish universities and institutes of higher education could be avoided by creating a new kind of job. This idea has been put forward by Professor N K Hermansen, director of the department of higher education.

The situation concerning research workers and the lack of cooperation between researchers employed by the public and those employed by the private industry were discussed during a press seminar organized by the Danish Council for Scientific Policy and Planning.

The number of scientific research workers is not sufficient and there are two reasons for this. One is the economic austerity measures imposed by the government and the other is due to the enormous input of research workers during the prosperous 1960s and at the beginning of the 1970s. Those employed then are now causing stagnation. It is now virtually impossible to employ young researchers within universities and institutes of higher education.

"If new jobs can be created, it will remove the present blockade of older researchers during the next ten years."

The plan is to create jobs for young researchers so that 4-5 per cent of the total staff of researchers will consist of the young generation. At the moment they only take up 1.5 per cent of the total staff.

Professor Hermansen said that the new jobs should concentrate solely on research work and that schoolships should be administered.

One of the principal aims of the UNU will now be to seek specific project funding, rather than relying on its endowment fund. So far 34 countries have pledged a total of \$144m, of which \$112m has been received.

"We estimate that for the medium term, there will be a five per cent annual growth in programmes. This will require an increase of \$12.5m in 1982 to \$28m by 1987," said Dr Soedjatmoko.

Another major aim of the UNU will be to develop its work of research, postgraduate training and dissemination of knowledge to enlarge its scope, broaden its perspective, make it more coherent, responsive and more interdisciplinary.

To achieve this the university has adopted five different themes covering broadly peace, the global economy, culture, science and technology. Specific issues to be looked at will be, for example, the problem of violence and human conflict and its contemporary manifestations in the pathology of the arms race.

Responsibility for implementing the themes has been given to three new divisions, covering development, regional and global studies and global learning. The latter is a totally new activity which will be concerned with the need for institutions and individuals to learn, how to identify, digest and use knowledge to meet new challenges and opportunities at the international, regional, national and community levels.

It is also planned to strengthen the intellectual and academic management of the UNU's headquarters by increasing the number of academics there and attracting a wider representation of disciplines. In particular, relations with the Japanese academic community will be strengthened.

This will become possible as a result of a gift from the Japanese government of a \$100m plot of land where a new building is to be put up to house the enlarged activities of the UNU.

The university also intends to become more decentralized, so that its presence and influence can be felt in an increased number of countries and regions. For example it will call on the full academic and other resources of associated institutions.

The crisis facing scientific workers in Danish universities and institutes of higher education could be avoided by creating a new kind of job. This idea has been put forward by Professor N K Hermansen, director of the department of higher education.

The situation concerning research workers and the lack of cooperation between researchers employed by the public and those employed by the private industry were discussed during a press seminar organized by the Danish Council for Scientific Policy and Planning.

The number of scientific research workers is not sufficient and there are two reasons for this. One is the economic austerity measures imposed by the government and the other is due to the enormous input of research workers during the prosperous 1960s and at the beginning of the 1970s. Those employed then are now causing stagnation. It is now virtually impossible to employ young researchers within universities and institutes of higher education.

"If new jobs can be created, it will remove the present blockade of older researchers during the next ten years."

The plan is to create jobs for young researchers so that 4-5 per cent of the total staff of researchers will consist of the young generation. At the moment they only take up 1.5 per cent of the total staff.

Professor Hermansen said that the new jobs should concentrate solely on research work and that schoolships should be administered.

One of the principal aims of the UNU will now be to seek specific project funding, rather than relying on its endowment fund. So far 34 countries have pledged a total of \$144m, of which \$112m has been received.

"We estimate that for the medium term, there will be a five per cent annual growth in programmes. This will require an increase of \$12.5m in 1982 to \$28m by 1987," said Dr Soedjatmoko.

Another major aim of the UNU will be to develop its work of research, postgraduate training and dissemination of knowledge to enlarge its scope, broaden its perspective, make it more coherent, responsive and more interdisciplinary.

To achieve this the university has adopted five different themes covering broadly peace, the global economy, culture, science and technology. Specific issues to be looked at will be, for example, the problem of violence and human conflict and its contemporary manifestations in the pathology of the arms race.

Responsibility for implementing the themes has been given to three new divisions, covering development, regional and global studies and global learning. The latter is a totally new activity which will be concerned with the need for institutions and individuals to learn, how to identify, digest and use knowledge to meet new challenges and opportunities at the international, regional, national and community levels.

It is also planned to strengthen the intellectual and academic management of the UNU's headquarters by increasing the number of academics there and attracting a wider representation of disciplines. In particular, relations with the Japanese academic community will be strengthened.

This will become possible as a result of a gift from the Japanese government of a \$100m plot of land where a new building is to be put up to house the enlarged activities of the UNU.

The university also intends to become more decentralized, so that its presence and influence can be felt in an increased number of countries and regions. For example it will call on the full academic and other resources of associated institutions.

The crisis facing scientific workers in Danish universities and institutes of higher education could be avoided by creating a new kind of job. This idea has been put forward by Professor N K Hermansen, director of the department of higher education.

The situation concerning research workers and the lack of cooperation between researchers employed by the public and those employed by the private industry were discussed during a press seminar organized by the Danish Council for Scientific Policy and Planning.

The number of scientific research workers is not sufficient and there are two reasons for this. One is the economic austerity measures imposed by the government and the other is due to the enormous input of research workers during the prosperous 1960s and at the beginning of the 1970s. Those employed then are now causing stagnation. It is now virtually impossible to employ young researchers within universities and institutes of higher education.

"If new jobs can be created, it will remove the present blockade of older researchers during the next ten years."

The plan is to create jobs for young researchers so that 4-5 per cent of the total staff of researchers will consist of the young generation. At the moment they only take up 1.5 per cent of the total staff.

Professor Hermansen said that the new jobs should concentrate solely on research work and that schoolships should be administered.

One of the principal aims of the UNU will now be to seek specific project funding, rather than relying on its endowment fund. So far 34 countries have pledged a total of \$144m, of which \$112m has been received.

"We estimate that for the medium term, there will be a five per cent annual growth in programmes. This will require an increase of \$12.5m in 1982 to \$28m by 1987," said Dr Soedjatmoko.

Another major aim of the UNU will be to develop its work of research, postgraduate training and dissemination of knowledge to enlarge its scope, broaden its perspective, make it more coherent, responsive and more interdisciplinary.

To achieve this the university has adopted five different themes covering broadly peace, the global economy, culture, science and technology. Specific issues to be looked at will be, for example, the problem of violence and human conflict and its contemporary manifestations in the pathology of the arms race.

Responsibility for implementing the themes has been given to three new divisions, covering development, regional and global studies and global learning. The latter is a totally new activity which will be concerned with the need for institutions and individuals to learn, how to identify, digest and use knowledge to meet new challenges and opportunities at the international, regional, national and community levels.

It is also planned to strengthen the intellectual and academic management of the UNU's headquarters by increasing the number of academics there and attracting a wider representation of disciplines. In particular, relations with the Japanese academic community will be strengthened.

This will become possible as a result of a gift from the Japanese government of a \$100m plot of land where a new building is to be put up to house the enlarged activities of the UNU.

The university also intends to become more decentralized, so that its presence and influence can be felt in an increased number of countries and regions. For example it will call on the full academic and other resources of associated institutions.

The crisis facing scientific workers in Danish universities and institutes of higher education could be avoided by creating a new kind of job. This idea has been put forward by Professor N K Hermansen, director of the department of higher education.

The situation concerning research workers and the lack of cooperation between researchers employed by the public and those employed by the private industry were discussed during a press seminar organized by the Danish Council for Scientific Policy and Planning.

The number of scientific research workers is not sufficient and there are two reasons for this. One is the economic austerity measures imposed by the government and the other is due to the enormous input of research workers during the prosperous 1960s and at the beginning of the 1970s. Those employed then are now causing stagnation. It is now virtually impossible to employ young researchers within universities and institutes of higher education.

"If new jobs can be created, it will remove the present blockade of older researchers during the next ten years."

The plan is to create jobs for young researchers so that 4-5 per cent of the total staff of researchers will consist of the young generation. At the moment they only take up 1.5 per cent of the total staff.

Professor Hermansen said that the new jobs should concentrate solely on research work and that schoolships should be administered.

One of the principal aims of the UNU will now be to seek specific project funding, rather than relying on its endowment fund. So far 34 countries have pledged a total of \$144m, of which \$112m has been received.

"We estimate that for the medium term, there will be a five per cent annual growth in programmes. This will require an increase of \$12.5m in 1982 to \$28m by 1987," said Dr Soedjatmoko.

Another major aim of the UNU will be to develop its work of research, postgraduate training and dissemination of knowledge to enlarge its scope, broaden its perspective, make it more coherent, responsive and more interdisciplinary.

To achieve this the university has adopted five different themes covering broadly peace, the global economy, culture, science and technology. Specific issues to be looked at will be, for example, the problem of violence and human conflict and its contemporary manifestations in the pathology of the arms race.

Responsibility for implementing the themes has been given to three new divisions, covering development, regional and global studies and global learning. The latter is a totally new activity which will be concerned with the need for institutions and individuals to learn, how to identify, digest and use knowledge to meet new challenges and opportunities at the international, regional, national and community levels.

It is also planned to strengthen the intellectual and academic management of the UNU's headquarters by increasing the number of academics there and attracting a wider representation of disciplines. In particular, relations with the Japanese academic community will be strengthened.

This will become possible as a result of a gift from the Japanese government of a \$100m plot of land where a new building is to be put up to house the enlarged activities of the UNU.

The university also intends to become more decentralized, so that its presence and influence can be felt in an increased number of countries and regions. For example it will call on the full academic and other resources of associated institutions.

The crisis facing scientific workers in Danish universities and institutes of higher education could be avoided by creating a new kind of job. This idea has been put forward by Professor N K Hermansen, director of the department of higher education.

The situation concerning research workers and the lack of cooperation between researchers employed by the public and those employed by the private industry were discussed during a press seminar organized by the Danish Council for Scientific Policy and Planning.

The number of scientific research workers is not sufficient and there are two reasons for this. One is the economic austerity measures imposed by the government and the other is due to the enormous input of research workers during the prosperous 1960s and at the beginning of the 1970s. Those employed then are now causing stagnation. It is now virtually impossible to employ young researchers within universities and institutes of higher education.

"If new jobs can be created, it will remove the present blockade of older researchers during the next ten years."

The plan is to create jobs for young researchers so that 4-5 per cent of the total staff of researchers will consist of the young generation. At the moment they only take up 1.5 per cent of the total staff.

Professor Hermansen said that the new jobs should concentrate solely on research work and that schoolships should be administered.

One of the principal aims of the UNU will now be to seek specific project funding, rather than relying on its endowment fund. So far 34 countries have pledged a total of \$144m, of which \$112m has been received.

"We estimate that for the medium term, there will be a five per cent annual growth in programmes. This will require an increase of \$12.5m in 1982 to \$28m by 1987," said Dr Soedjatmoko.

Another major aim of the UNU will be to develop its work of research, postgraduate training and dissemination of knowledge to enlarge its scope, broaden its perspective, make it more coherent, responsive and more interdisciplinary.

To achieve this the university has adopted five different themes covering broadly peace, the global economy, culture, science and technology. Specific issues to be looked at will be, for example, the problem of violence and human conflict and its contemporary manifestations in the pathology of the arms race.

Responsibility for implementing the themes has been given to three new divisions, covering development, regional and global studies and global learning. The latter is a totally new activity which will be concerned with the need for institutions and individuals to learn, how to identify, digest and use knowledge to meet new challenges and opportunities at the international, regional, national and community levels.

It is also planned to strengthen the intellectual and academic management of the UNU's headquarters by increasing the number of academics there and attracting a wider representation of disciplines. In particular, relations with the Japanese academic community will be strengthened.

This will become possible as a result of a gift from the Japanese government of a \$100m plot of land where a new building is to be put up to house the enlarged activities of the UNU.

The university also intends to become more decentralized, so that its presence and influence can be felt in an increased number of countries and regions. For example it will call on the full academic and other resources of associated institutions.

The crisis facing scientific workers in Danish universities and institutes of higher education could be avoided by creating a new kind of job. This idea has been put forward by Professor N K Hermansen, director of the department of higher education.

The situation concerning research workers and the lack of cooperation between researchers employed by the public and those employed by the private industry were discussed during a press seminar organized by the Danish Council for Scientific Policy and Planning.

The number of scientific research workers is not sufficient and there are two reasons for this. One is the economic austerity measures imposed by the government and the other is due to the enormous input of research workers during the prosperous 1960s and at the beginning of the 1970s. Those employed then are now causing stagnation. It is now virtually impossible to employ young researchers within universities and institutes of higher education.

"If new jobs can be created, it will remove the present blockade of older researchers during the next ten years."

The plan is to create jobs for young researchers so that 4-5 per cent of the total staff of researchers will consist of the young generation. At the moment they only take up 1.5 per cent of the total staff.

Professor Hermansen said that the new jobs should concentrate solely on research work and that schoolships should be administered.

One of the principal aims of the UNU will now be to seek specific project funding, rather than relying on its endowment fund. So far 34 countries have pledged a total of \$144m, of which \$112m has been received.

"We estimate that for the medium term, there will be a five per cent annual growth in programmes. This will require an increase of \$12.5m in 1982 to \$28m by 1987," said Dr Soedjatmoko.

Another major aim of the UNU will be to develop its work of research, postgraduate training and dissemination of knowledge to enlarge its scope, broaden its perspective, make it more coherent, responsive and more interdisciplinary.

To achieve this the university has adopted five different themes covering broadly peace, the global economy, culture, science and technology. Specific issues to be looked at will be, for example, the problem of violence and human conflict and its contemporary manifestations in the pathology of the arms race.

Responsibility for implementing the themes has been given to three new divisions, covering development, regional and global studies and global learning. The latter is a totally new activity which will be concerned with the need for institutions and individuals to learn, how to identify, digest and use knowledge to meet new challenges and opportunities at the international, regional, national and community levels.

It is also planned to strengthen the intellectual and academic management of the UNU's headquarters by increasing the number of academics there and attracting a wider representation of disciplines. In particular, relations with the Japanese academic community will be strengthened.

This will become possible as a result of a gift from the Japanese government of a \$100m plot of land where a new building is to be put up to house the enlarged activities of the UNU.

The university also intends to become more decentralized, so that its presence and influence can be felt in an increased number of countries and regions. For example it will call on the full academic and other resources of associated institutions.

The crisis facing scientific workers in Danish universities and institutes of higher education could be avoided by creating a new kind of job. This idea has been put forward by Professor N K Hermansen, director of the department of higher education.

The situation concerning research workers and the lack of cooperation between researchers employed by the public and those employed by the private industry were discussed during a press seminar organized by the Danish Council for Scientific Policy and Planning.

The number of scientific research workers is not sufficient and there are two reasons for this. One is the economic austerity measures imposed by the government and the other is due to the enormous input of research workers during the prosperous 1960s and at the beginning of the 1970s. Those employed then are now causing stagnation. It is now virtually impossible to employ young researchers within universities and institutes of higher education.

"If new jobs can be created, it will remove the present blockade of older researchers during the next ten years."

The plan is to create jobs for young researchers so that 4-5 per cent of the total staff of researchers will consist of the young generation. At the moment they only take up 1.5 per cent of the total staff.

Professor Hermansen said that the new jobs should concentrate solely on research work and that schoolships should be administered.

One of the principal aims of the UNU will now be to seek specific project funding, rather than relying on its endowment fund. So far 34 countries have pledged a total of \$144m, of which \$112m has been received.

"We estimate that for the medium term, there will be a five per cent annual growth in programmes. This will require an increase of \$12.5m in 1982 to \$28m by 1987," said Dr Soedjatmoko.

Another major aim of the UNU will be to develop its work of research, postgraduate training and dissemination of knowledge to enlarge its scope, broaden its perspective, make it more coherent, responsive and more interdisciplinary.

To achieve this the university has adopted five different themes covering broadly peace, the global economy, culture, science and technology. Specific issues to be looked at will be, for example, the problem of violence and human conflict and its contemporary manifestations in the pathology of the arms race.

Responsibility for implementing the themes has been given to three new divisions, covering development, regional and global studies and global learning. The latter is a totally new activity which will be concerned with the need for institutions and individuals to learn, how to identify, digest and use knowledge to meet new challenges and opportunities at the international, regional, national and community levels.

It is also planned to strengthen the intellectual and academic management of the UNU's headquarters by increasing the number of academics there and attracting a wider representation of disciplines. In particular, relations with the Japanese academic community will be strengthened.

This will become possible as a result of a gift from the Japanese government of a \$100m plot of land where a new building is to be put up to house the enlarged activities of the UNU.

The university also intends to become more decentralized, so that its presence and influence can be felt in an increased number of countries and regions. For example it will call on the full academic and other resources of associated institutions.

The crisis facing scientific workers in Danish universities and institutes of higher education could be avoided by creating a new kind of job. This idea has been put forward by Professor N K Hermansen, director of the department of higher education.

The situation concerning research workers and the lack of cooperation between researchers employed by the public and those employed by the private industry were discussed during a press seminar organized by the Danish Council for Scientific Policy and Planning.

The number of scientific research workers is not sufficient and there are two reasons for this. One is the economic austerity measures imposed by the government and the other is due to the enormous input of research workers during the prosperous 1960s and at the beginning of the 1970s. Those employed then are now causing stagnation. It is now virtually impossible to employ young researchers within universities and institutes of higher education.

"If new jobs can be created, it will remove the present blockade of older researchers during the next ten years."

The plan is to create jobs for young researchers so that 4-5 per cent of the total staff of researchers will consist of the young generation. At the moment they only take up 1.5 per cent of the total staff.

Professor Hermansen said that the new jobs should concentrate solely on research work and that schoolships should be administered.

THESE correspondents take stock of the cultural, economic and political implications of

Whitehall's chance to rethink fees Australian charges 'idiotic'

by John O'Leary

This month sees the crucial second examination by the Government of the effects of the policy of full-cost fees for overseas students, introduced amid clamours of protest two years ago. The exercise represents probably the best opportunity before a General Election to reassess calmly the impact of unprecedented fee levels with the minimum of political pressures at home and recent evidence of feeling abroad.

Debates at two Commonwealth conferences and numerous representations by individual foreign government representatives have shown clearly enough that the policy remains deeply worrying to Third World nations which have traditionally looked to Britain to provide the quality of education necessary for development. Numbers inevitably have dropped, if not as sharply as the most alarmist predictions had it, still by proportions which would have been unthinkable in any other time.

Yet, despite the apparent enthusiasm for aid shown at last month's Mexico summit and the acceptance of higher education's value in the development process, the trend among Western countries since Britain's lead has been towards similar,

if less severe measures. It should not have escaped ministers' notice that the example has not been followed in the communist nations, where Cuba has now joined the Soviet Union, Romania and East Germany in offering large numbers of free places to students from the Third World.

In Britain, however, there has been little sign that the Government is seriously considering an about turn on one of its most controversial policies in education. The introduction of full-cost fees was one of the first initiatives taken after the Conservative's General Election victory in 1979, and one which ministers have defended consistently in the face of all-party criticism.

After the initial rises, which came to more than 100 per cent on many courses, further increases above the rate of inflation were imposed at the start of the new academic year. University arts courses now cost at least £2,500 a year, with their equivalents in the maintained sector set at £2,649; laboratory-based courses are a minimum of £3,600 in the universities and £3,673 elsewhere; while some university medical courses now cost £6,000 a year. The fees make up the highest average yearly cost in the world by far and are on a par with

the most prestigious private universities in the United States.

Although scholarship programmes have been restored to previous levels, few concessions have been made since the fees were introduced. Residence qualifications remain confused and are still being tested in the courts, only EEC countries have succeeded in special pleading and refugee students remain the only campaigning success story.

Even allowing for 'early and sympathetic' consideration of the Commonwealth report on student mobility, as promised at the Melbourne heads of government meeting, there is little likelihood of further exemptions from the fees. Although the Overseas Students Trust is in the midst of an examination of policy alternatives commissioned by the Government, the review is not expected to yield more than minor modifications to the system.

Early indications of this year's recruitment show that last year's decline has been all but arrested in the universities at least. But with last year's final figure, put by the Department of Education and Science at a drop of 19 per cent, in doubt right until the year's end, the eventual outcome may be less favourable. The final impact on Britain's trade

and political relations abroad has also yet to be felt, although high commissioners, ministers and even heads of government themselves have made clear their displeasure over the policy. For this reason, the many campaigners in the field are optimistic about the effect of the quiet but definite change of approach towards foreign students in Whitehall. The Foreign and Commonwealth Office has taken over as the lead department from the DES.

Comparisons with other countries are not easily made, both because of the scarcity of reliable information and the variety of means used to control numbers of overseas students, where they exist. However, it seems that while a number of Western countries have followed Britain in bringing in tighter controls, none has been so crudely negative. France, for example, has raised fees considerably for most foreign nationals but exempted Francophones. Others have introduced quotas, the last mechanism to be rejected in this country.

There is no doubt that the increasing demand for high level courses from Third World countries in particular is coming to be recognized by developing countries as a problem as educational costs continue to rise.

charges 'idiotic'

by Geoff Maslen

Up to 10,000 overseas students at Australian universities are required to pay between \$1,500 and \$2,500 (£900 and £1,500) a year towards the cost of their tuition. Most of the students are from Asia and the Pacific, and they have protested that the fees are impoverishing the families at home and will drastically reduce the numbers of students in the future.

The Australian Government introduced the charges last year, claiming the decision was consistent with overseas practice where foreign students attending tertiary institutions were required to contribute to the cost of their education. The Government also assisted in alleviating the "current excess demand" for places available to overseas students. Government spokesmen said at the time the decision was announced. Unfortunately the Government appears not to have confirmed it with any Australian university, as there was no consultation with the countries the students come from. Instead, the Government claimed that fees would raise some \$40m which would "help defray the costs at present met in full by Australian taxpayers".

Students from developing countries have been going to Australia for the past 30 years, either as called private students, or as some kind of sponsorship by the Australian Government or the governments of their countries. Sponsored students who are exempt from fees decision make up about 2/3 of the total. Before the decision was proposed, it was estimated that the number of overseas students in Australia would probably increase by 3 per cent in the next few years. This figure may not now be reached unless the Government changes its mind.

In all, there are more than 30 countries with which Australia has made bilateral agreements to assist in the training of their students, but many more as private students from other countries. The National Overseas Students Service has bitterly criticized the Government's imposition of tuition fees, describing it as short-sighted and idiotic. NOSS claims that overseas students have made a substantial contribution to the Australian community in terms of postgraduate research and in the promotion of friendship and good will between the Third World and Australia. In monetary terms, overseas students brought in \$A20m a year, while the cost to Australia was only \$A15m a year, a spokesman for the service said.

the world's army of students attending foreign institutions

by Uli Schmetzer

An Italian government campaign to cut the growing army of foreign students has met strong reaction.

Hundreds of students, most of them from Third World countries, who face repatriation and loss of the chance to study, went on hunger strikes and demonstrated throughout the country, camping in lecture halls and dormitories.

They threatened to die rather than leave their studies if the education ministry does not repeal a directive which imposed *numerus clausus* on foreign students, making available for them only 8,831 places, roughly half of those needed.

It is the first time since Italy introduced an open campus policy in the early 1970s that the ministry has imposed numerical restrictions on foreign students.

It has also dissolved the concentration of the foreign student population at two or three universities, dispersing the foreigners over 33 campuses and avoiding situations like in Perugia where thousands of Middle East students fought ideological battles last year.

From now on students have virtually no choice of campus since the academic council at each university informs the ministry at the beginning of the year how many foreign students they are willing to accommodate. A central ministerial body then decides who to send where.

The ministry's directive (published last November but ignored by the students until implemented this autumn) follows the decision two years ago to make language tests compulsory before enrolment. This was to weed out those who enrolled without speaking a word of Italian or as a device to enable them to remain in the country.

Reaction to the latest squeeze caused a chain reaction of protests spearheaded by several hundred Iranian students who allege they face firing squads at home for their anti-

Khomeini stand if forced to return to Iran.

At Camerino University 19 students (ten Italians, nine Greeks and one Jordanian) on hunger strike forced the campus council to reconsider their quota and give them another chance to pass an Italian language test.

At Pescara 100 Iranians have been on a two-week hunger strike. They have taken over the great hall of the language faculty where they sprawl in sleeping bags and covered by blankets, some emaciated to the point of collapse. Nine of the strikers have already been taken to hospital but the rest threatened to refuse liquids as well unless the ministry offers them a chance to enrol.

At Perugia more than 200 foreign students, mainly Iranians, have also begun a hunger strike. Student leader

er Firuz Valizadeh said: "After 50 days of trying to achieve something by diplomatic means we are ready to try any means to ensure we can study in Italy."

Academic staff and ministry officials agree that the measures have hit many genuine students though thousands of African and Arab students are taking advantage of the situation, enrolling each year for courses they never attend in order to remain in Italy - often as black market labour.

The crackdown was made easier for the government by the assassination attempt on Pope John Paul II. Turkish terrorist Mehmet Ali Agca had enrolled at Perugia's university for foreigners under a false name.

And some weeks ago a score of African students were deported after police found they were running a

BRIEFING

lucrative drug ring.

The thorny issue of fees (stationary since the 1960s) had already caused a stir on campuses which have been unusually calm.

In order to deflect accusations that the new fees would penalize students from poor families, a decree published this month exempts students whose total family income is below £8,000.

The extra fees range from a minimum £25 to a maximum £75 and are based on the tax returns of the student's family - £175 for a family income exceeding £17,000.

The new fees are in addition to the £10 a year enrolment fee and £30 a year tuition fee and for the 1982-83 academic year the government has built in an automatic 20 per cent across-the-board rise.

One of the quaint provisions is a penalty clause for students of music, dance and dramatic arts. They have to pay an additional £20 a year for their "unfortunate" choice of subject.

students were financed by the Irish government while a further 18 were on United Nations, EEC and other awards.

The recent appointment of an admissions officer to HEDCO - Higher Education for Development Cooperation - is likely to lead to greater order and uniformity in the approach to overseas students.

Although there are similar type bodies in other countries - relating institutions of higher education to overseas needs - HEDCO is unusual in a number of respects. It associates in one body almost all third level educational institutions - universities, institutes of higher education, or of technology and regional technical colleges; its brief is also to facilitate the contribution of its members not only to universities and other third level educational bodies overseas, but to any area of an overseas country's development.

HEDCO's general secretary, Mr Paul Murphy, hopes that the colleges will take not just academic criteria into account when admitting overseas students. He would like to see students sponsored from developing countries who will use their acquired expertise in the development of their own countries when they return home.

The Union of Students in Ireland is expected to push strongly for provision for students from liberation movements.

The union is concerned over the rapidly escalating costs for overseas students studying in Ireland. This year most colleges have raised their fees substantially; in the case of Trinity College, Dublin, the surcharge for non-EEC students jumped from 60 to 100 per cent. But even at around £1800 per student in Trinity, the fees are still very low compared with British colleges.

The exception is the Royal College of Surgeons in Ireland, which gets very little state aid and charges full economic fees. The college takes a third of its students from developing countries, a third from Ireland. There is no shortage of takers for any of the places on offer.

Irish people have long been concerned about less developed parts of the world; they demonstrated this first through the missionaries and more recently through lay organizations working for relief in the third world. The work of HEDCO is taking that tradition a stage further and this is being matched by government decisions.

Japan decides to go for higher number

by Martin Roth

The Japanese Government has declared its intention of boosting the number of foreign students in the country, to an extent fitting Japan's international status. However, it is likely that most of these students will be from Asian nations.

In the 1980-81 university year there were just 6,572 foreign students in Japan, a tiny figure when compared with most Western countries. Of these, 1,369 were receiving Japanese Ministry of Education (Nonbusho) scholarships.

But earlier this year the Japanese Government approved funding of 6,596m yen (£15.4m) for student exchanges in the current fiscal year, 17 per cent more than the last fiscal year; and in August the Education Ministry declared that, in line with promises made during a tour of South-East Asia by Mr Zenko Suzuki, the Prime Minister, Japan would step up its programme of accepting students from Asian countries.

In particular, it wanted more students at the undergraduate level.

At present, more than 90 per cent of the Nonbusho scholarships have been for postgraduate work, mainly in engineering and the sciences. During the 1981-82 university year the Government planned to offer Nonbusho scholarships to 950 new students, an increase of 160 over last year. This is expected to rise to 1,150 next year.

As well as accepting more students, the Government also intends to devote more money to student accommodation, and to improve Japanese language training.

Nonbusho scholarships were initiated in 1954. At present they provide free tuition, round-trip air tickets, an arrival allowance of 25,000 yen, a field study allowance of 43,000 yen a year, a housing allowance of about 11,000 yen a month, 80 per cent of all medical fees, and an annual allowance of 117,000-161,500 yen a year, depending on the type of scholarship.

There are four kinds of scholarship. The first is for undergraduates, and is generally restricted to those from Asian countries.

The second is for graduate research students, and is limited to two years, and the third for Japanese studies students.

Nearly 80 per cent of all the foreign students in Japan are from Asian countries, 8 per cent from the United States, and a sprinkling from the rest of the globe.



Young Tanzanians head for Moscow and higher education.

All this, and grants too

by Michael Binyon

More than 80,000 foreign students from 145 states, almost half of them from developing Asian, African and Latin American countries, are studying at Soviet higher education and research institutions, and in July some 15,000 received diplomas and degrees, according to Mr Nikolai Mokhov, the Soviet Deputy Minister of Higher Education.

The number of foreign students is rising steadily, and increasingly older men and women who are already working are being sent to the Soviet Union for specialized training. Annual systematic enrolment of foreign students began in 1958, the first graduating in 1965, and since then some 140,000 have graduated from Soviet institutions.

Foreign students are trained in

almost 200 disciplines. Mr Mokhov said he expected that during the eleventh five-year plan, which began in January, the Soviet Union would educate around 100,000 foreign students.

Moscow is the main centre for foreigners, taking about 2,000 a year. Most study at the Patrice Lumumba University, which was founded specially to train Third World students and celebrated its twenty-first anniversary in February. But overseas students also are found in a total of 300 higher education institutions throughout the country, especially in the south where the climate is less burdensome for those coming from Africa and Asia.

Tuition for all foreign students is free, and in addition they are entitled to grants.

Provinces call the tune

by Peter David

In Canada, the provinces have determined the country's policy towards overseas students. Unlike the United States, however, Canada has seen a steady trend in recent years towards charging differential fees.

Four provinces - British Columbia, Saskatchewan, Manitoba and Newfoundland - continue to charge overseas students the same fee as Canadians. But the others, notably Quebec, have introduced sharply higher fees for foreign students.

In 1978 Quebec made foreign students pay double the Canadian fee and this year raised the foreign fee to more than \$C4,000 a year compared with a home fee of only about \$C700. Ontario, which contains about 13,000 of the nation's 28,000 overseas university students, doubled the home fee for overseas students in 1977.

Alberta introduced a \$C330 overseas student surcharge in 1977, and the maritime provinces decided in 1979 to charge overseas students twice the Canadian rate.

Despite these measures, Canadian higher education is still regarded as a cheaper proposition for overseas students than either the United States or Britain, and the introduction of differential fees has not resulted in an obvious fall in applications.

Universities are this year reporting a steep rise in applications as a result of the introduction of full-cost fees in Britain.

Call for national policy as balance shifts

by Peter David

A phenomenal increase in the number of overseas students flocking to American universities is prompting university leaders to take their first tentative steps towards formulating a national policy on admissions.

A major report just released by the American Council on Education points out that the United States is one of the few Western countries not to place restrictions on students from abroad. In large part, the nation's policy towards foreign students is the sum of decisions made by individual universities, or states with a minimum of federal Government interference.

All this could change if the predictions about the increase in foreign enrolments contained in the ACE report prove correct. The council estimates that the present total of 312,000 overseas students is likely to rocket to half a million by 1985 and a million or more by the early 1990s. From accounting for only 2.5 per

cent of the student population now, foreign students would then constitute 10 per cent of all enrolments.

The growth in numbers has been rapid and largely unplanned. Before the war there were never more than 25,000 overseas students in the United States, most of whom were European. Now more than half of the country's 312,000 foreign students come from the Middle East and Asia, and only 8 per cent from Europe.

In 1979-80 the main sending countries were Iran (51,000 students); Taiwan (17,500); Nigeria (16,360); Canada (15,150); Japan (12,260); Hong Kong (9,900); Venezuela (9,860); Saudi Arabia (9,540); India (8,760) and Thailand (6,500). According to the ACE report, the biggest expansion in the future is likely to come from the Opec and better-off countries, with a corresponding decline in students from poorer parts of the world.

The change in the balance of stu-

dents and the prospect of large increases in enrolment have persuaded some university presidents in the United States to advocate a more systematic and nationally coordinated policy towards overseas enrolments.

The ACE report, estimating that there could be one foreign student for every four American students in graduate schools by the next decade, says: "Should these projections prove true, the character of American campus life will change dramatically over the next decade as foreign students come to represent a significant segment of the student body."

"That impact could be enhanced if foreign students, taking the cue from their domestic counterparts, begin to grow more assertive about placing responsibility on and demanding accountability of institutions for meeting their needs."

Nobody in the United States knows exactly how all the country's foreign students are financed, but a

recent estimate by the Institute of International Education in New York was that the vast majority - some 66 per cent - received most of their income from personal and family sources.

Another 13 per cent were supported by their home governments and 3 per cent by private overseas sponsors. More than 9 per cent received some assistance from their host university, 2.7 per cent from the United States, and 1.9 per cent received most of their funds from private American sponsors and foundations. United States Government assistance was the primary source of funds for only 2 per cent of overseas students.

The American Council on Education estimates that the total direct cost of educating foreign students, including tuition fees, living expenses and incidentals - is in the neighbourhood of \$2,500 a year.

Only some of these costs are paid for by the United States. About

from poor to rich

30,000 foreign graduate students hold teaching or research assistantships paid for by their host university. An additional 30,000 a year receive official permission to work off-campus and many more work in university cafeterias and libraries.

Some 5,000 foreign students receive federal government scholarships under the United States aid programme, and an approximately equal number are supported by private agencies, notably the Ford, Rockefeller and Kellogg Foundations, church groups and social service organizations like Rotary International.

Foreign sponsors bear a much larger share of the costs. Nigeria, Saudi Arabia and Mexico run large government programmes to send students to the United States. The biggest source of finance for foreign students, private and family finance, accounts for an annual inflow of hundreds of millions of dollars into

the United States economy. Tuition fees in the United States vary widely from institution to institution, but in general foreign students are charged at the same rate as American out-of-state students. Average fees in 1980-81 were \$3,279 a year in a four-year private university, and \$1,724 in a similar public university.

In the wake of the Iranian hostage crisis last year, some states considered introducing higher fees for overseas students. Only one such provision was passed - in Florida - where it was vetoed by the Governor. The only other example of differential fees so far appears to be in Idaho, which introduced a \$30 non-resident alien fee surcharge on the tuition rate.

The rising number of overseas students is not yet causing any political difficulties, according to a survey of 1,475 public universities and colleges conducted by the Institute of International Education.



High hopes: student midwives arrive in London from Nigeria.

Ministers aim to improve conditions

by James Hutchinson

The education ministers of the West German Länder have established the principle that foreigners wishing to attend their universities "must be in a position to complete their studies successfully within a reasonable period".

On admission they must have the necessary academic qualifications, an adequate knowledge of German and financial means.

The ministers, at a meeting of their standing committee, adopted proposals designed to "improve the conditions for foreign students". The proposals are principally concerned with applicants from developing countries who comprise the largest proportion of foreigners. Most students from other countries stay only one or two terms in Germany.

Last March the ministers said an exceptional influx of applicants from Greece, Turkey, Iran and Indonesia made it necessary to introduce new regulations. Two-thirds of the students from these countries, it was said, did not know sufficient German and many had no financial support. This jeopardized their chances of success, and had created a situation which could not be in their best interests.

It was then decided that residence permits must be obtained at German consulates abroad before the applicants left for Germany, and that permits would be issued only if the applicants could show they had been granted a place. Closer scrutiny of academic qualifications was also ordered.

At their latest meeting the ministers claimed credit for pursuing a liberal policy towards foreigners. Contrary to other industrial countries, they pointed out, West Germany did not charge tuition fees.

During the last winter term nearly 58,000 foreigners were enrolled at German universities, 5.5 per cent of the total student population. Some 60 per cent of them were from developing countries. The ministers said they had no intention of reducing the number of places for foreign students.

Ireland popular but space shortage prompts bias towards poor states

by John Walshe

Ireland is becoming an increasingly popular choice for overseas students. But the simple fact is that the republic's colleges have not enough room for all the qualified Irish people applying for places. Consequently, there is a growing belief that the relatively few places available to overseas students should go to those from poorer countries, rather than to applicants from the wealthy Arab or African nations.

Over the past few years, the number of inquiries from overseas has risen sharply, mainly, it is thought, because of the British Government's decision to charge economic fees to non-EEC students. The widening range of courses in the technological and engineering fields is another reason: the absence of racial tensions is thought to be yet another.

This year, for instance, the Sligo Regional Technical College - not a large college by any means - received about 100 fully completed applications and twice that many other enquiries. Another regional technical college principal reported a telephone call asking if his college could take a few dozen Arab students.

The Central Applications Office which acts as a clearing house for applications to universities, and some other colleges received 1,200 overseas applications this year. But many other inquiries were made directly to the colleges, particularly to the ever-popular medical schools. Trinity College Dublin's medical school reported a steady stream of well qualified applications from as far away as Singapore.

The numbers who eventually get a place are not large by European standards. In a country with under 40,000 full-time higher education students last year, 5 to 5.5 per cent were from outside Ireland. Of the non-Irish students, three out of five were from outside the EEC, mainly from African or Arab countries.

In addition, there were several hundred others on shorter or postgraduate courses, on special technical training courses or studying for a traditional school leaving certificate to enhance their prospect of higher education entry.

The majority of the non-EEC students are financed privately, ie, either by their parents and relatives or in the case of students from the Middle East by their governments; many of the Palestinian refugee students are financed by the Libyan government. In June this year, a total of 41 full-time higher education

students were financed by the Irish government while a further 18 were on United Nations, EEC and other awards.

The recent appointment of an admissions officer to HEDCO - Higher Education for Development Cooperation - is likely to lead to greater order and uniformity in the approach to overseas students.

Philip Meeson on the dilemmas of art-teaching and Peter Abbs on

It's imagination . . . but

Tolstoy in *What is Art?* gives a vivid description of the imagination at work. He uses the example of the boy relating his experiences of meeting a wolf, and in order to evoke in others the feeling he has experienced, "describes himself, his condition before the encounter, the surroundings, the wood, his light-heartedness and the wolf's appearance, its movements, the distance between himself and the wolf, and so forth." If the boy when telling his story "infects" the hearers with his feelings of fear and excitement so that they experience the same feelings then, Tolstoy claims, the result is art. From this Tolstoy derives his well known definition of art as a process of evoking in others a feeling one has once experienced oneself.

There is much in this, one suspects, which would be acceptable to most people as an accurate description of the artistic process. It assumes that the aim of art is to describe in such a way that not only the listener or spectator's knowledge is increased or memory stirred but his imagination fired also. It assumes further that the wish to create artistically arises out of a deeply felt experience which the artist wishes to communicate to others. Looking at the artist himself, whether storyteller, painter, actor or musician, it might be argued that what distinguishes him is his proficiency within whatever art form he practices, but again one would expect that his capacity to feel deeply would be counted a more important attribute than technical skill alone.

Tolstoy's implied definition of art as expressive skill rooted in deeply felt experience if used as the starting point for a theory of art education would result in a particular kind of art teaching which would consist, essentially, of three elements. Firstly, there would need to be an element of experience either contributed directly by the pupil or stimulated by the teacher. Secondly, there would need to be an element of skill in the communication of one's feelings and ideas to others, and thirdly, there would need to be some encouragement on the part of an audience, even if only in the form of a willing suspension of disbelief, to sustain the performer's confidence, at least in the initial stages of the artistic enterprise.

Significant in Tolstoy's view of art is the place given to imagination; He

assumes that it is imagination which gives both purpose and value to the creative act in art. It is inconceivable within his view of art that the activity should stop short at the performance stage, at the question "what would make a good story?" for example. It is precisely this kind of "intellectual" thinking which in other parts of the book he criticizes vehemently.

Tolstoy's idea of imagination in art is, of course, a romantic one. It places prior emphasis upon the personal feelings of the artist and his public, but it lies in common with many other views of art in deriving its *raison d'être* from an assumption that it is the imaginative involvement of the artist with his public through the work of art which is in the end what matters most in art.

This assumption is also found, although at a less obviously personal and subjective level, among the supporters of the classical view of art up to the end of the eighteenth century. Sir Joshua Reynolds in his *Lectures* gives a full and detailed description of the classical method in art but his advice to the student is dependent upon a mutually shared acceptance of what might be called the classical dream; the possibility of achieving a degree of perfection transcending the imperfect and uncontrolled forms of nature. Here again, an educational programme fashioned about the classical method as expounded by Reynolds would have little meaning to those who had not experienced that dream, it would appear to follow a merely arbitrary routine and its skills would seem increasingly irrelevant.

One final example of how educational programmes in art are often at their inception derived from this imaginative area of artistic experience can be seen in the development of what until very recently was the lively myth of "modern art". Much of the impetus behind the upsurge of energy supporting modern art in the 1920s and 1930s came from an imaginative fascination with the trappings of industrialized life and with the growing intellectual climate of science and technology which supported it. Paul Klee, one of the central figures in the translation of this imaginative excitement into academic form, turned the methods of scientific thinking into what are used and also its customary attitudes, particularly its emphasis on experiment and the objectification of

knowledge in the form of hypotheses leading to the establishment of laws. Klee, however, turned all this into metaphor whose only relationship to the real world of science lay in its speculative and searching mode of procedure.

Klee's peculiarly idiosyncratic, quasi-scientific approach to art has formed the basis of much art teaching today, but his particular vision of modernity has faded, leaving behind a series of exercises which can, like those of the classical method, become increasingly meaningless without the infusion of that imaginative vision which Klee possessed in common with his contemporary ideologists in the early years of the developing modern world.

The significant educational point which emerges from these three examples is that effective art teaching requires the shared acceptance at the outset of a desirable imaginative goal, the teacher's task being to generate enthusiasm in the pursuit of that goal and to offer advice on the technical means for achieving it. The generation of enthusiasm is vital for it is only this enthusiasm which in the end gives value to the whole enterprise. From the point of view of art as a creative activity, whatever media, methods or techniques are used, these are all dependent upon a particular expressive aim, but in the absence of any enthusiasm for that aim technical knowledge in itself becomes pointless. One might, of course, abandon the view of art as essentially creative altogether, and with it the view that art is a matter of imagination, substituting for this attitude one that makes the educational problems of art easier to handle; namely, the view that art is essentially historical and that what counts as knowledge in art is knowledge of tradition and convention. But in taking this step one needs to be clear what sacrifices will have to be made. One will need to leave behind questions of personal and subjective response leading to activities of making and communicating in favour of what amounts to an institutional view of art which rests on the idea that only certain kinds of knowledge (in this case that kind which is essentially

factual) are suited to teaching within the customary kind of educational institution. In essence, this results either in a regression to a simple view of the purpose of teaching as concerned primarily with the conservation of knowledge or towards a preference for the quantifiable as against the less tangible areas of personal enthusiasm or vision.

The major distinction between these two approaches to the problems of art education at a curriculum level lies between the idea of art as something like a game where it is futile to ask what the purpose of it all is (the student's answer, "Because it is Tuesday") to the question, "Why are you painting the figure?" is not as silly as it seems at first sight) and the apparently more secure institutional approach which suggests the existence of a definable body of knowledge not necessarily dependent upon a personal or collective enthusiasm.

The point of art and equally the point of a game lies in one's physical or imaginative involvement in it. One engages in a game out of one's enthusiasm for the activity itself. It might be argued, and indeed it has long been argued, that the playing of games is conducive to good health which has generally been thought of as a desirable goal in itself, but people do not play games merely on the basis of such calculation. Similarly with art, one's involvement in it ought to be out of one's enthusiasm for the activity itself not only out of consideration for some putative gain which the activity might bring, although such gains are apparent in a developing sensibility and imaginative awareness.

Of course, teaching in any subject cannot rest upon the requirement that those who are being taught will bring an innate enthusiasm to their learning, but art is perhaps more fortunate than many other subjects in that those who come to it do often bring a higher than average amount of enthusiasm with them.

The value of art rests, ultimately, on the strength of one's imaginative involvement with it, but it is this final justification for art which is being increasingly challenged by a recent hardening of the institutional attitude in education. Those who look upon games players as "flannelled fools" or "muddled oafs" are not likely to be persuaded by any

overt justifications of the value of playing games. Similarly, those who are ignorant of the imaginative functions which arise out of art's involvement with any kind of activity are going to be very difficult to convince of its value.

At this point one touches upon an important central truth about education's culture; it is borne along by this essentially a matter of fact, either of a personal or collective kind. Once, however, such imagination and its aura of enthusiasm decline there comes a point when, in the words of Rebecca West, there is no longer any conversation.

The institutionalizing of discussion in the arts (what at the present moment has given rise to the idea of an "art world" or forum which defines for us what art is) is both a fact of art today also, when it emerges as a theory of how art is possible, as an expression of a prevailing cultural tendency. This particular tendency which has been with us for many years may be defined as a growing acceptance within society to let upon the language of science as a proper language of public discourse. It might be more accurate, however, to speak of this not as a language but as a quasi-language for it does not follow the discipline of scientific language proper but only its mannerisms and its broadly held assumptions.

Within this quasi-language directed towards the idea of knowledge as publicly testable and quantifiable much of reality is of necessity excluded, namely, that area of life rooted in subjective experience which cannot be communicated through a form of language which implicitly hints that such experience is either trivial or irrelevant. The problem for the art teacher, no more than for the artist who cannot simply walk away from it, is that he cannot escape its influence altogether, is to preserve against its prevailing cultural stance an effective language of subjective feeling which is able to convey meaning to those for whom such meaning may already have been written off as unimportant.

It needs to be said that the language of discourse within the arts is certainly within the visual arts, is often more of a hindrance than a help in dealing with this problem, for

the power of self-inflection is it really art?

what the mannerisms of science might be suitable material from which to fashion a work of art, when they are used within the discourse of the objectification of knowledge is by its very nature unsuited to communication of subjective truth.

At this ideological level language can both hinder or facilitate the communication of meaning, a point familiar to structuralists, but equally familiar to post-structuralists, but equally familiar to contemporary attitudes. Thus, the adoption of a certain view of language and of what is creatively possible within the arts can arise out of a kind of *post hoc*, *propter hoc* reasoning based on nothing more than a limited familiarity with customary modes of thinking and of the immediate here and now. At this point "conversation" becomes less and less a possibility except amongst a shrinking cultural élite or "art group".

One need go no further than the identification of broad cultural determinants in coming to some conclusions about the possible future direction of educational ideology. In so far as education is concerned with knowledge then what counts as knowledge will be a vital factor in determining the shape of education to come.

The prevailing pressure within education to distinguish between means and ends, to identify aims and objectives and to fashion programmes which are readily open to external evaluation is evidence of quasi-scientific thinking at work. Art, if it is to conform to this pattern must be at least publicly, its traditional concern with such notions as beauty, inspiration, intuition, imagination and possibly expression and if it is to assimilate itself to this contemporary cultural development. Already one can see this happening not only in the terminology of art educational discourse but also in the practical aspect of education where the distinction, as Sir Hugh Casson described it in a recent Royal Society of Arts lecture, between "making and doing" and "thinking and writing" is too often resolved in favour of the latter attitude. The emphasis on a social reading of art leaving little room for consideration of personal sensibility (still less for the idea of genius) is yet another example of

a cultural swing away from personal and subjective experience towards abstraction and ideology.

But does this matter? Is not all this the outward sign of an inevitable fading of the romantic concern with personality and with the idea of the artist as hero, as the age of romanticism itself slips into the past? Certainly, that late flowering of the romantic movement "modern art" no longer commands the same enthusiasm as it once did and in this situation one might expect new avenues to be explored and new interests to be released.

In art education something of this search for a new direction is apparent but overall, however, there is much evidence of regression or at least of conformity, sometimes grudging but also unfortunately willing, to institutional ideas of art which, where they are not simply misguided, arise from intellectual traditions often quite alien to the artistic experience.

To return to Tolstoy, much of the success of what can now be seen as the great period of art education, starting with Cizek in Vienna in the 1890s and ending in the late 1950s with Lowenfeld in America, including Marion Richardson and Herbert Read in this country, was the result of a widely held acceptance of the truth contained in Tolstoy's expressionistic view of art, certainly so far as children are concerned. This is not to be confused with the doctrine of self-expression which is now under heavy criticism which came from no artistic tradition at all but from the science of psychology. The truth is that for most people and certainly for children art is imagination allied to descriptive skill. When art education ignores this either by adopting reductive intellectualist notions of art which in effect deny the fact of personal experience or imagination or through conformity to a method of thinking which cannot encompass such subjective realities it runs the danger of becoming simply irrelevant - the knowledge which it aims to teach ceases to have any bearing upon that area which alone can give art any meaning, that of the inner world of the imagination.

The author is lecturer in the Centre of Art and Design Teacher Education at Brighton Polytechnic.



It's autobiography . . . but is it a legitimate form of study?

It is strange, indeed, that autobiography which emerges as a specific literary genre in the *Confessions* of St Augustine (yet did not gather great impetus until the *Confessions* of Rousseau) has not been seen as a fit subject of literary investigation and philosophical analysis. Most of the great European writers of the last two centuries wrote some form of autobiography: Tolstoy, Mill, Ruskin, Gorki, Newman, Goethe, Darwin, Freud, Jung, Yeats, Muir, Read, Collingwood, Russell; the list is impressively long and yet academics have seemed reluctant to touch such an intimate symbolic form of investigation, have seemed to imply that such a study might lack rigour, even bring the student too close to the raw struggling impulses of individual lives.

There is now, especially in America, a thriving study of autobiography. James Olney recently edited a symposium - *Autobiography: Essays Theoretical and Critical* - in which he claimed that this burgeoning interest in the autobiographical genre can be dated back no further than 1956 when George Gadsdord published his perceptive *Essays on Conditions and Limitations of Autobiography*. This philosophical study, with its roots in Dilthey's major writing, was followed in Britain by Roy Pascal's *Design and Truth in Autobiography*, a pioneering work which attempted to offer both a historical study of autobiography and a definition of its essential nature. And now, it would seem, like any new field which has

been, after great neglect, quickly claimed and hedged, there are many critics ready to turn the ground.

In an introduction to the 1981 symposium, James Olney outlines three reasons for the refusal to allow the autobiographical form as a legitimate area for study. First, he argues, it was avoided because as a form it insists on a primary existential connection between written word and actual life. We find autobiographers difficult to discuss because we feel we are condemning a person whom we adversely judge his life not, as an easy separation between form and existence, creates unease, discomfort, embarrassment. The study of fiction - of imaginative constructions - more easily avoids such alarm, it distances the overall dilemma.

The second reason Olney gives is perhaps less convincing. He suggests that literary critics have expected literature to possess a wholeness and coherence which autobiography, by its very nature, cannot possess. But this is not the case, for many autobiographers, like Edmund Gosse's *Father and Son*, Herbert Read's *Annals of Innocence and Experience* and Kathleen Raine's *Foreward to Py Fields*, possess a remarkable degree of inner consistency and poetic wholeness. The boundaries between fiction and autobiography are never clearly drawn. Those autobiographers possess an all but luminous objectivity. It is also the case that since at least the time of T. S. Eliot's *The Waste Land*, literary critics have been well aware of the place of radical fragmentation and discontinuity in the poem, the play and the novel. Olney's point founders both in the direction of literature and pure autobiography.

The third reason for the neglect of the genre, it is claimed, lies in the fact that autobiography is, by its very nature, self-reflexive. It allows for criticism and commentary within itself. "The autobiographer," Olney writes, "can discuss and analyse the autobiographical act as he performs it." The autobiographer is his own literary critic. This is true, but doesn't fully illuminate why autobiography has been excluded from academic study.

Olney's first reason seems to go furthest towards explaining the gap. After all, it is not difficult to find, at least in this country, parallels in other disciplines. Why, for instance, has philosophy not encouraged the study of Pascal, Nietzsche, or Kierkegaard? Is it not because such writers think their philosophy through the medium of their own vulnerable experience and existence and keep their disturbing opinions painfully close to sudden personal intuition and the piercing shaft of existential insight. It reduces the comfort of objectivity, discipline, classification, impersonal distance. It is interesting to note that the librarian classifies "Autobiography" under "Biography" and "History". Perhaps, through this kind of evasive labelling, the

person who insists on stammering out of his own existence, who insists on finding the true lineaments of his own elusive personality, will be contented. Classified as an historian, his testimony, as personal truth, may pass more or less unnoticed.

The danger of any academic study of autobiography is that it may, like the librarian's classification, collectivize the genre and deny the resistant personal essence. A danger but not an inevitable one, for the very heart of educational activity is to unsettle, to shake the weaponry of opinions into a thousand fragments, to engender unease, and so to slowly cultivate intellectual enquiry, moving from the self, tentatively outwards. The educational act and the autobiographical act, in other words, are one; and it is this connexion which, in spite of the present academic interest in autobiography, has not, I believe, been properly forged.

The importance of autobiographical writing as an educational discipline is increasingly recognized and work with undergraduate and research students has yielded impressive results. Official recognition has begun to appear in the form of "innovations in education" in which the arts and course. "Language and autobiography education" is its full significance.

The great power of autobiography as a creative discipline of attention lies in the fact that it compels the student to connect education with existence, theory with actual experience. It prevents the student from

slavishly thinking within the categories which, he believes, the teacher has made definitive. It urges the student to move in his own space and clarify his own meanings before he is engulfed by the theories of others.

Such a discarding of conventional props can lead to anxiety but such anxiety becomes the necessary emotional condition for authentic reflection. Perhaps the best way of illustrating the point is by quoting from some very recent essays, written by MA students, and which illustrate the kind of creative unease which can attend such work:

As a product of our present educational system I had always lived by the assumption that knowledge existed outside of the individual; the answers were out there if one could only trace and digest the appropriate text. I was advised when I first started this task of the autobiographical self-analysis that it would be a very difficult and demanding and, at times, dangerous, it would prove. However, having embarked on the journey of self-exploration I have travelled a very unusual pathway to self-discovery; one which had led me to question my sunny, given me a whole new conceptual view of the state of man's "being in the world" and led me to question strongly our present processes of socialization and education.

Such writing can also reveal the great trauma indicated by our present utilitarian educational system and attempt to heal them. Another

MA student described a critical point in his life when he was first made redundant:

What, at first, seemed like a welcome release from years of monotony slowly took on the aspect of a confirmation of my own view of my education - a thorough and complete waste of time. The jobs that were available simply did not appeal to me as they seemed to be more of the same. I found myself jobless and a large part of my social life had been taken away from me. This left me disoriented and confused and led to profound self-doubts. For perhaps the first time I was forced to ask myself what was the purpose of my existence.

The educational system had encouraged his interest in purely objective science and this "had slowly and almost completely eradicated the subjective within myself and any latent creative talent." In reacting against an extreme rationality and the predicament in which it left him, he felt he had fallen into the opposite extreme, into the irrational, into a crippling and isolating kind of subjectivity. Extreme rationality and extreme irrationality feed off each other in a schizoid and destructive manner and the autobiographical essay culminated in an attempt to draw emotion and reason into relationship and to define a kind of symbolic knowledge - a *mythos* - which embodied both the personal and the representative, the unique individual and the human race.

A third essay describes with moving simplicity an early childhood experience and then moves back on it to explore its latent meanings, its full epistemological implications. By any standards it is an impressive personal essay. With quiet assurance, all the great philosophical questions are tested out of the most intimate experience:

It has to be stressed again that in all this painful striving for insight with its vivid sensations, feelings and imaginings, the thread of rational, intelligent, thought remained inextricably entwined so that it was not possible to separate feelings from intelligence. They flowed the one into the other, along with the images and sensations, and the process had a wholeness about it.

The *autos* in autobiography refers, of course, not to ego, that defensive and dishonest construct, but to identity, the self that longs to exist through all its multifarious experience. In joining identity and knowledge, perhaps autobiography is uniquely equipped to bring together epistemology and ontology and so to end the destructive division between the knower and the known which informs nearly all our educational institutions. If the present interest in autobiography could be extended to education and if it could begin (as is its nature) to integrate being and knowing, then it would be responsible for securing a great and necessary shift in modern consciousness, of effecting a philosophical revolution long overdue.

The author has written, "Autobiography in Education," distributed by the Gryphon Press.



Wets, dries and the Tories of the 1840s

Geoffrey Finlayson on an historical parallel to the present Conservative dichotomy

The present controversy in Tory circles between "wets" and "dries" is one which has striking parallels in the earlier history of the party. The terms and the issues to which these relate are new, but the argument, between those who stress economic and fiscal solutions to problems and those who question the social cost of such an approach and who favour measures which have a more explicitly social content, is not.

One such dispute arose in the 1840s, a time of considerable social tension and distress in Britain. Charitism was a symbol of working class discontent with harsh social and economic conditions which had set in during the later 1830s and which were to continue sporadically throughout the 1840s. Such conditions also favoured the development of the Anti-Corn Law League. Partly a product of middle-class disillusionment with the Reform Act of 1832, the league appealed to businessmen who felt that governments - Whig or Tory - had little understanding of their needs and paid undue attention to the landed interest.

To the Chartist, a radical reform of the political system would bring about social regeneration; to the League, repeal of the Corn Laws would weaken the status of the landed interest which they protected, recognize the importance of the middle classes and open up markets for business enterprise. The Tory Party, coming into office under Sir Robert Peel in 1841, thus felt he to formidable problems, which the Whigs in their last years of office in the late 1830s, had seemed powerless to solve: economic dislocation, social distress, radical protest.

Peel's solution to the "Condition of England" question was primarily economic. He sought to create the conditions in which business initiative and commercial enterprise could flourish and expand. This involved freeing the business and commercial interest from restrictions - particularly trading restrictions - and private economic activity could pick up. In time, this would result in higher profits, better wages and fuller employment. It was in this spirit that Peel framed his great free trade budgets of 1842 and 1845; repeal of the Corn Laws in 1846 was essentially a continuation of the same policy. It was in his spirit, too, that the Bank Charter Act and the Companies Act of 1844 were framed; they would ensure that, when it came, the economic expansion would be based on sound and solid foundations and genuine business enterprise would be rewarded.

For Peel, therefore, economic strength was all important; it was this which would promote material well-being and social stability. In the prosperity which would be induced, all classes would share; the middle and working classes would clearly benefit from the increased business activity and employment, and the landed interest could, in Peel's view, well survive the dismantling of protection.

Such a policy, however, was not without its critics in the Tory Party. There were those who felt that it was too materialistic and commercial, that the laissez-faire system which was being promoted ran the race too much to the swift and took insufficient account of those who might be trampled underfoot, that economic strength must not be purchased at the cost of social neglect. Such critics were to be found in the Young England group of Tories, to which the young Disraeli belonged, which disliked and condemned industrialization and the middle-class interest, and called for a union of upper and working classes to heal the divisions of the "two nations". This, however,

was an idiosyncratic group, whose invocation of medieval practice and pagantry did nothing to add to its credibility and authority. A more substantial critic was Lord Ashley, Tory member for Dorset and heir to the Earldom of Shaftesbury. Already in the late 1820s and 1830s, Ashley had shown sympathy with the plight of helpless and vulnerable sections of society, such as lunatics (to use the contemporary term) and children and young persons in factories.

In part, this sprang from a sense of *noblesse oblige*, from the paternalistic belief that persons of rank and station had a social duty to protect those who could not protect themselves. From the mid-1830s, however, Ashley's social concern was increasingly influenced by his Evangelicalism. The existing state of society, he felt, condemned thousands of his fellow countrymen - all precious in the sight of God and for each of whom Christ had died - to live and work in conditions which defaced their spiritual capacity and made them quite unable to seek their salvation. What wonder, he wrote in 1836, that the factory worker limited "the operations of an immortal soul to unceasing labour and disgusting sensuality" and never looked to higher things. The public was under an obligation to see that he had "both time and opportunity for the cultivation and exercise of his immortal part".

In 1840, Ashley justified the motion which he proposed in Parliament for the appointment of the Children's Employment Commission partly on grounds of the harmful effects which, he alleged, employment had on health and morals; if the country was economically strong and pre-eminent, it should be widely known at what cost such strength and pre-eminence was purchased. But higher considerations were also at stake: the objects of the investigation were "beings created, as ourselves, by the same Maker, redeemed by the same Saviour and destined to the same immortality". They must, therefore, be relieved of their sufferings.

Ashley, indeed, constantly set himself as a clear and inescapable duty to God and to man - the task of removing temporal obstacles to spiritual fulfilment by promoting measures of social amelioration. The task was the more urgent in the light of his firm belief in the imminence of the Second Coming; man must be in a state of readiness to meet his Saviour.

To Ashley, Peel's measures were soulless, devoid of principle and vision and lacking in concern for the social and spiritual welfare of ordinary people. Such people could have no understanding of the technicalities of tariffs nor could they see any immediate or long-term advantage in Peel's policies. They would, indeed, be driven into the arms of the Chartists, for they would conclude that the governing classes cared nothing for their sufferings. Peel's refusals create an appetite for O'Connor's "offers", Ashley wrote.

The opposition of Peel and Graham, the Home Secretary, to a ten-hour day for factory workers under the age of 18 earned Ashley's bitter criticism. This was a measure of social improvement which, he felt, would be of immediate and tangible benefit; it would bridge labour, give more time for spiritual concerns and bring about social reconciliation. But in 1843 and 1844, Peel and Graham remained resistant to Ashley's constant promptings. "The most dishonest of all public officers", Ashley wrote of Graham, and of Peel, "Imports and exports, here is



Pius ça change? Four faces of English conservatism: Thatcher, Peel, Shaftesbury, St John-Stevens.

Peel's philosophy! There it begins and there it ends." On another occasion, he commented that all Peel's attitudes were towards wealth and capital: "what has he ever done or proposed for the working classes?" Cotton is everything, man inchoing.

It could be argued that some of this criticism sprang from personal antipathy and disappointed ambition. Ashley found Peel's manner distasteful and aloof; it was he who coined the famous phrase that to be in Peel's company was akin to being in "the neighbourhood of an iceberg with a slight thaw on the surface".

It is also true that Ashley - who did not lack ambition and had a thirst for recognition - had been greatly disappointed by the offers of office which he had received from Peel in the 1830s and in 1841. In 1834, he was offered the post of Civil Lord of the Admiralty in the Commons. He accepted it but was disappointed that a better offer had not been made. "What a humiliation for an ambitious man," he wrote.

Worse was to come, for at the Bedchamber Incident in 1839, Peel offered him an appointment in the Royal Household, an offer which was repeated when Peel finally came into office in 1841. Ashley was appalled. Employment in the Household would give him the opportunity of exhibiting "nothing good but [his] legs in white shorts". He turned down the offer of 1841 and the episode left a "legacy of bitterness" in Ashley's dealings with Peel.

Against these points, however, it must be said that Ashley was not alone in finding Peel's manner cold and stiff, and such was his commitment to a ten-hour factory bill in 1841 that he would almost certainly have turned down any offer of office in Peel's administration - although he would have savoured the satisfaction of turning down a more substantial one.

It might also be urged that Peel and Ashley had much in common over their ultimate aims in terms of promoting social reconciliation and ending class bitterness. Both wanted to stifle the efforts of the Chartists and the League and to preserve the existing order of society by containing radical demands. Further, Peel's ministry did witness the passing of the Mines Act of 1842 and the Factory

Act of 1844, both of which brought about a measure of social improvement by means of government intervention. And Ashley himself came to the view that Corn Law repeal was inevitable and, in the circumstances, desirable; in this he found himself in substantial agreement with Peel, though he felt that Peel's "U-turn" on repeal was too abrupt, too many strains on his followers and was too inconsistent with past professions. Ashley himself felt obliged to resign his seat on his own conversion to repeal.

Yet even allowing for the fact that the two men could share common aims and that their methods were not mutually exclusive, there was a significant difference of emphasis. The measures to regulate mines and factories owed more to the prompting of Ashley than to official Tory initiative; and to Ashley, they did not go far enough in affording protection to workers. Considerations of output and profit were, he felt, given priority over social, moral and spiritual values. Production was given primacy over people.

To Peel, on the other hand, the scale of protection which Ashley desired would hinder production, give an advantage to Britain's competitors, endanger the recovery which he sought to promote, and thus put at risk the livelihood of the very persons whom Ashley wanted to assist. Put another way, to the "dry" Peel, economic strength was worth fostering and waiting for and must not be impeded by social measures, however well-intentioned these might be. To the "wet" Ashley, economic solutions which did not take sufficient account of social cost were wrong and indefensible. Man was primarily a social, moral and spiritual being and only secondarily an economic one, and the policy of governments must not run counter to this.

Even allowing for the entirely different economic circumstances in which today's "wet" and "dry" debate takes place, the issues are basically the same. Those Tories who criticize present official Tory policies often sympathize with the long-term economic aims of these policies, but they question their social consequences and fear that they will lead to a divided society and alienate the Tory Party from large sections of the community. Geoffrey Smith wrote in

The Times in June that the nightmare of present-day Tory paternalists is that "the Conservative Party might come to be seen as the representatives of a privileged minority, the voice of wealth, the spokesmen of the bosses". Such persons are harbouring the same fears of the "dry" policies of the 1840s as Ashley harboured of those of the 1840s. To keep the historical analogy, in a recent article Hugh Thomas likened Mrs Thatcher to Peel. It would not be difficult to find heirs to the Ashley/Shaftesbury legacy.

Who got it right in the 1840s, Peel or Ashley? Some would argue that the advantage lay with Peel, that, in time, his approach paid off by contributing to the economic recovery and strength which characterized Britain in the 1850s, a decade which saw the virtual disappearance of radical activity. Others would argue that Ashley's efforts contributed to an awareness of social, moral and spiritual issues which added an extremely important dimension to the debate in the 1840s and promoted ameliorative action.

In 1850, Ashley claimed that his efforts had led to an "awakened attention... to the wants and rights of the poor; to the powers and duties of the rich". The claim was a just one, and if Peel's work did help to lay the foundation of future economic strength, that of Ashley contributed towards social improvement, reconciliation and harmony.

Moreover, Ashley's paternalism, stretching beyond individual acts of kindness and compassion and establishing legislative protection, established a feature of Conservatism which, since his time, has always been present within the party, and which his present-day "wets" who claim Disraeli as their mentor ought more correctly to claim Ashley. The "One Nation" approach was, indeed, ascribed to Disraeli, was, indeed, urged by him, but this was more a matter of rhetoric and reality joined together to form a living creed and a spur to action.

The author is head of the Department of Modern History at the University of Glasgow. His biography of the Seventh Earl of Shaftesbury was published by Eyre Methuen in May.

What's happening to big government?

Actions of society as a whole affect the success of national programmes, says Richard Rose

Everybody talks about big government today, but do they necessarily know what they are talking about? What does it mean to say that government today is bigger than it was 50 years ago? Or that British government is much smaller in absolute terms than the government of the United States, and relative to population, than government in Sweden?

When politicians talk about big government, they usually do so in terms of *a priori* values. British socialists are committed to big government as a good in itself, a means of collectivizing production and consumption. Middle-class non-socialists as well as Labour-voting council house tenants benefit from the major educational, health and income maintenance programmes of the welfare state. Keynesian economists argue that government should play a big part in the economy, if the economy is to grow as much as it can.

Conservatives, especially of the market economy type, argue that big government is a bad government. Arthur Seldon of the Institute of Economic Affairs has calculated that two thirds of public expenditure by British government could be eliminated, if government concentrated solely upon the "necessary" evil of providing public goods. Less government would mean less taxes, and more money for individuals to choose for themselves what they wanted to buy. Free market economists argue that it is British government's involvement in the mixed economy that makes economic growth so low.

In reality, the bulk of polemics about big governments is not about the size of government, but about government *per se*. If government's status as assumed to be intrinsically good, then the more that government does, the better society will be. If government is thought to have bad effects, the bigger government is, the worse things will be.

Little thought has been given to answering the simple question: what grows when government grows?

Social science theories about the growth of government are plentiful, but inconclusive. Some theories assume that whatever size government achieves must be the optimum size. As long as government is popularly elected, it will provide what the voters want. Other theories explain the growth of government as a natural consequence of economic growth. When people have more money, they will want more education, health care, and pensions, services that government provides in the contemporary welfare state. Demographic factors can also be cited to explain governmental growth. When more babies are born, there will be a need for more schoolteachers.

But other theories of the growth of government are less optimistic. For example, growth may occur because the producers of public policies - the bureaucrats within government organizations - want growth to increase jobs and salaries. On this hypothesis, education would grow whether or not there were more pupils in schools. Structural changes in the economy can also cause government to grow. When large firms are faced with bankruptcy, government may take them over to maintain employment. And when public employees demand higher wages, government can use its taxing powers to raise the money to increase their wages, without the constraints of a private sector firm.

So far for party policy or ideology. It is expected to determine the size of government, then British govern-

ment should hardly have changed in scale in years, for Conservative and Labour parties have alternated regularly in office. Government could be expected to grow under Labour, and contract under the Conservatives. But the last Labour government was attacked by its own supporters for making cuts (or putting cash limits on public spending). The present Conservative government can see public expenditure as a share of the Gross National Product increase, if only because the economy has been deteriorating.

Lots of theories about the growth of government sound plausible, but all of them cannot be equally true. Conceivably, each of them can be partially true, or true about some periods in post-war British history, or true about Britain but not America or Sweden or vice versa. However, little forethought and time has been given to answering the seemingly simple question: what grows when government grows?

That is why the Centre for the Study of Public Policy at the University of Strathclyde sought SSRC sponsorship for a major five-year programme of research on the growth of government in the United Kingdom since 1945. The SSRC has given the centre a £288,000 grant to research this problem, starting in January.

Conceptualization comes before quantification. In order to study big government we must first of all know what government is. The social science answer is that government is a complex system of inter-related elements. In everyday language, Queen Victoria was right to refer to government in the plural. It is many things, and the different elements of government cannot be reduced to one single, simple measure.

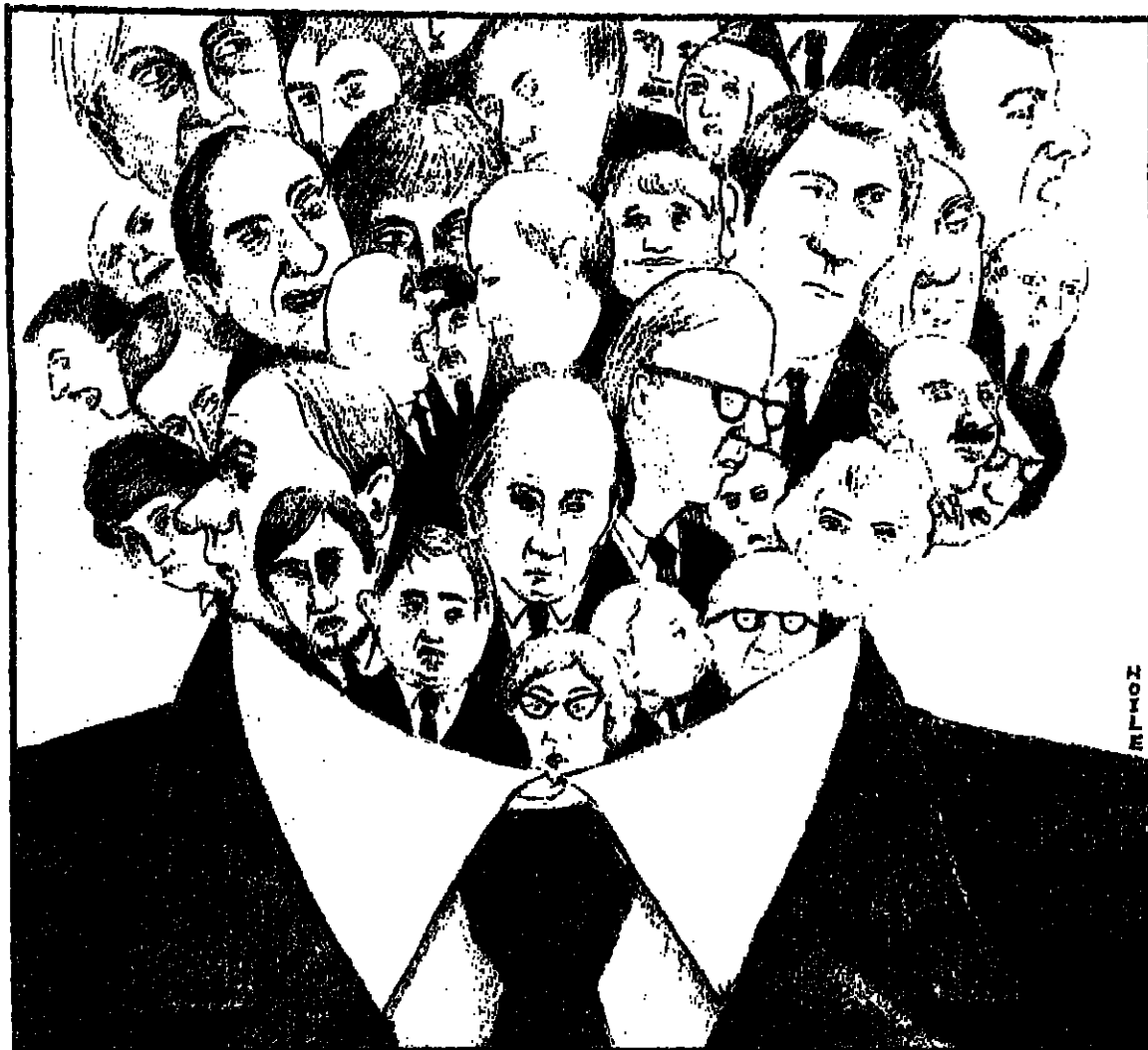
We define government in terms of what it is, a complex of organizations, ranging from Whitehall to the furthest reaches of quangodoms, like the Red Deer Commission in Inverness. We also recognize government by what it does: its organizations are core institutions; laws, money and personnel are the necessary resources, and programmes the policy outputs.

Money is not the only measure of government, nor is public expenditure the best initial indicator of the government's pecuniary concerns. Before a government can spend money, it must raise money. Hence, growth in public revenue is a necessary condition of growth in public spending. Taxation is the most viable way in which public revenue grows. For that very reason, resistance to increased taxes may cause government increasingly to raise more money by borrowing, or by making profits (or reducing losses) in nationalized industries.

Public employees are another necessary resource of government. A large portion of public revenue is spent paying salaries of public officials, less than a tenth of which are in the civil service. Public employees usually work for local government; the output of many local government policies is the service of local government employees, such as school teachers and social workers. In a period of high unemployment, a job in government is immediately a benefit, even before the service the worker is meant to provide.

Laws are a much overlooked *sine qua non* resource, for money and personnel can only be spent when authorized by Act of Parliament. Parliament enacts a relatively small number of laws each year, and the rate has not significantly altered in this century. Cumulatively, laws are powerful, for most of the laws that the government of the day must uphold and pay for are acts passed by their predecessors, and not necessarily by their own current politicians.

Organizations are central in government; for they both secure resources and combine them into programmes. Constitutionally, the Crown



is singular, but empirically government consists of hundreds or thousands of organizations. We do not know exactly, nor for that matter does Whitehall. Organizations appear more likely to multiply away from Whitehall rather than within it. Most government policies are delivered by local authorities, nationalized industries, the health services and that green jungle that the Italians call the *parastatale* (the parastate) sector.

When we look at government in terms of programme outputs, a fundamental change occurs. We see growth in health, education and unemployment programmes, and contraction in defence. Pilot research indicates that there may be greater similarities in the dynamics of the same programme (eg health or defence) in different countries than there is in different programmes in the same country.

When growth involves new policies in previously unexplored areas, then effectiveness may be less

Because government is a plurality of elements, different parts of government can grow in different directions. In Britain, we have seen the number of organizations in local government contract by two thirds in the past decade, while the number of employees in local government has increased by one eighth, and the amount of money spent, in current terms, has increased more than three times.

When global totals are disaggregated, the same dimension of government can show growth in different directions. For example, in the past 30 years public employment in defence, both uniformed and civilian, has contracted by more than 600,000, and in coal mining by a similar figure. Concurrently, "armies" of teachers and national health service employees have been added to the public payroll.

Even when growth occurs in the same direction, it can occur at a very different tempo, in different parts.

For example, public employment as a percentage of the labour force has only grown by about 15 per cent in Britain since 1951. But public expenditure, when measured in constant money terms, has increased by 300 per cent, and by much more than that if calculated in current money terms.

"Unbalanced" growth is the best way to describe the growth of government in the United Kingdom since 1945. Different elements of the system grow according to their own logics. The growth of pension payments does not involve new laws and organizations; it requires more public revenue to pay bigger benefits to more people. The growth of the health service is pre-eminently a growth in employees in the health service. Town and country planning growth programmes typically grow by the enactment of more laws and regulations. Legislation on public morality has been more distinctive still; in a permissive era change has meant the repeal of laws censoring the theatre, and regulating sexual activities.

Given the variety of things that government is and does, simple judgments about the growth and size of government are likely to be "too simple by half." But enough research has been done to suggest a few hypotheses about characteristics of big government, and of big government becoming bigger still.

In so far as the growth of government is concentrated in already established programmes, then it is likely to be a relatively effective means of producing policy outputs. Public employees do know how to teach basic skills of literacy, how to deliver babies safely, pay pensions or run buses.

The chief problems caused by the growth of established policies are twofold. The first is paying for the added cost of programmes that already make a substantial claim on public revenues. The second is justifying the extra money needed when growth is an unintended consequence of past commitments.

Mrs Thatcher was not elected on a manifesto promising to increase the size of government. Yet spending increased. Economic difficulties have pushed up public spending for "uncontrollable" commitments, and reduced the gross national product available to finance such spending. A

newly elected Labour government might want to spend more money on the welfare services, but it might find itself committed instead to spend more money to subsidize British industry.

When the growth of government involves new policies, this raises two distinctive problems. If new policies are adopted in fields where there is already substantial government activity, say, industrial and regional policy, then contradictions are much more likely. This is particularly true with big government. In an essay about "policy as its own cause", Aaron Wildavsky emphasizes, "interdependence among policies increases faster than knowledge grows."

When growth involves new policies in previously unexplored areas, then effectiveness may be less. By definition, new programmes will occur when government has not yet demonstrated that it has effective means-ends technology to achieve its aims. For example, in the United States, the two novel initiatives of the Johnson administration failed, not for lack of effort, but for lack of means-ends technology. The war on poverty was launched with good legislative intentions but without knowledge of how legislation could end poverty. The Vietnam war showed that the Pentagon knew how to get soldiers into the jungle, but not how to get victory out of a jungle war.

The bigger government becomes, the more difficult it is to make a global judgment about government, independent of a judgment about society as a whole. When government is big, then many of its actions affect citizens directly or indirectly. Equally important, many of the actions of citizens also affects the success of government programmes. This is true in the mixed economy welfare state of Britain today, and it is especially true about a big problem that grows greater still, the problem of economic growth. Just as we cannot expect the government of a poor Third World country to transcend national limitations, so today we cannot expect a big Western government to be more successful than its society.

The author is director of the Centre for the Study of Public Policy at the University of Strathclyde.

BOOKS

Women challenging the medieval world

by R. I. Moore

Enemies of God: the witch-hunt in Scotland
by Christina Lerner
Canto & Windus, £12.95
ISBN 0 7011 2434 5

Joan of Arc: the Image of female heroism
by Marina Warner
Weidenfeld & Nicolson, £9.95
ISBN 0 297 77638 X

The last ten years or so have transformed the history of witch beliefs and witch-hunting in Europe. Around the beginning of this century two great liberal scholars, Joseph Hansen in Cologne and Henry Charles Lea in Philadelphia, charted a progressive broadening of the definition of enemies of the faith in the torture chambers of the inquisition, from the Cathar and Waldensian heretics of the thirteenth century to the alleged acolytes of Satan who were condemned and burned in ever rising numbers until the peak of the persecutions in the later sixteenth and seventeenth centuries. As Hugh Trevor-Roper put it, in his brilliant essay on *The European Witch Craze* (1967), "The monks of the later Middle Ages sowed the seeds of the sixteenth century reaped; and what a harvest of witches they gathered in!"

This grizzly continuity was massively denied in 1975, when Norman Cohn showed that the series of mass trials and executions in Toulouse and the Italian Alps in the fourteenth century, which for Hansen and Lea had linked the work of the medieval inquisition with that of the witch-hunters of Reformation Europe, were fabrications, their documentary basis the work of modern forger-romancers. A year later Richard Kieckhefer re-examined the chronology of the witch trials, and showed that it was not until after about 1450 that Europeans seriously accused each other on any significant scale of subjecting themselves to the devil and carrying out his work.

The new chronology was sharpened further as European historians began to see more clearly what Africans had always known, that accusations of witchcraft may have many functions. Edward Peters (whose *The Magician, the Witch and the Law* [1978] would have helped both Christina Lerner and Marina Warner) revealed a broad deposit of belief in the efficacy of sorcery among both the peasantry and the literate of Europe in the Middle Ages, but also made it clear that the rash of sorcery charges in the courts of the early fourteenth century were part of the armoury of political intrigue and factional competition, quite distinct from the later hunting for Satanic covens among the peasantry by grim-faced friars and lawyers.

Christina Lerner's is the latest, and probably the best, of the many regional studies of the witch-hunt which have accompanied and greatly stimulated this general revision. Outstandingly readable, it is equally notable for the vividness with which it brings its human subjects to life and for the novelty and importance of its conclusions.

The Scottish witch-hunt, given its legal framework by the Witchcraft Act passed in 1563 and repealed in 1735, shared most of the characteristics of the series of persecutions which continental Europe experienced during the same period. The influence of Roman law in Scotland permitted torture, and therefore the rapidly widening circles of denunciation which England was spared. But, as elsewhere, the pattern was not one of general or systematic persecution, but of intermittent major scares - five of them swept the nation between 1591 and 1662 - punctuated by more localized panics to which some areas were particularly prone. The neighbourhoods of Aberdeen, Stirling and Edinburgh, the Lothians and the fishing villages of the east coast from Fife to Berwick, were much the worst affected areas, while

the Gaelic-speaking highlands were quite untouched.

The Scottish hunts also resembled those of the continent in their origins and aims. Dr Lerner is in no doubt that witchcraft and witch-hunting were "a phenomenon essentially imposed on the powerless by the powerful, rather than a spontaneous peasant movement". There was among the peasantry an ancient bedrock of belief in *maleficium* (the ability of particular people to harm their neighbours by pronouncing spells on their crops, animals, or children) which served as a means of enforcing and reinforcing acceptable standards of neighbourly conduct in these as in rural communities in so many parts of the world. Witch-hunting began when the officers of kirk and state seized upon accusations of such activity as evidence of a satanic conspiracy whose members must be identified and extirpated. The work was done, under Privy Council warrant, by commissions of ministers and landed gentry.

Many studies have made this pattern familiar, but we still lack a thoroughly convincing explanation of it. Generalization based on local experience relies too easily on local factors, or forgets that strains and conflicts detected in witch-hunting areas were often just as prominent in others. Witch-hunts occurred without discrimination in Protestant and Catholic Europe; in areas of peasant unrest and apparent docility; in areas and at times of hardship and relative prosperity; and so on.

Christina Lerner offers a new explanation of the Scottish witch-hunt. Between the Reformation and the emergence of the secular state in the eighteenth century Christianity was the dominant political ideology, and "enemies of God" the natural description of those whom it was convenient to attack in order to create social and political unity. The pursuit of witches - which reached its periodic heights of frenzy at moments when kirk and state were disputing the boundaries of their respective roles in the new Scotland with particular intensity - provided an economical means of advertising the moral purity and effectiveness of the new regime.

The idea of creating social unity by exclusion is (though not new) something of a catch-all, an explanation to fill a vacuum from which others have been expelled - especially clear, as Lerner argues convincingly, a clear or direct correlation cannot be made between the incidence of witchcraft accusations and the prevalence of social tensions which might give rise to them. The hypothesis is not, in this form, relate the function it suggests for witch-hunting closely enough to other forms of persecution. To say, for example, that "heresy-hunting might be devised: witch-hunting unites a people" is to risk arbitrarily giving an objective reality to one target of persecution which is rightly denied to the other. Nevertheless this is an important and skilfully argued case which will have to be widely debated.

Dr Lerner's materials on the victims of the witch-hunts enable her to reconstruct a full and interesting account of popular beliefs in *maleficium* and its significance, and to present a convincing depiction of the circumstances in which witch accusations typically arose. Unsurprisingly, those suspected of the greatest majority of women - 80 per cent overall, and the higher proportion than that during the major panics, when women were perhaps more vulnerable to being swept into the net of casual or separate denunciation. Since in many cases the men who were implicated were drawn in by the confessions of women already questioned, it may be suspected that an even higher proportion of witch trials was initiated by charges against women.

Dr Lerner agrees with Alan Macfarlane and Keith Thomas that the typical "witch" was not only a woman, but one who, through



Joan of Arc, as identified with the spirit of national defence; an engraving by Schiller's epic drama "Die Jungfrau von Orléans".

poverty or mismanagement, had become a burden on the community which it was convenient to discharge by means of the accusation. Spells were regularly alleged to have been cast against those who had refused help or alms, or declined to co-operate in some way with a less prosperous neighbour. The accusation therefore served to liberate the relatively fortunate from the obligations of a disintegrating ethos of collective responsibility.

Among the many roles which Joan of Arc played to her contemporaries that of the witch was comparatively unimportant, though perhaps not quite so much, as Marina Warner book - in no sense a conventional biography - considers in detail each of the parts in which Joan cast herself, or was cast by her supporters or enemies - knight and saint, prophet and witch, amazon, virgin and heretic - exploring the associations of each through legend, literature and art as well as the standard historical sources.

The cult of Joan of Arc was inaugurated, in effect, by the publication of prosefying memoirs, in 1612 and 1613, by writers who claimed descent from her family. Since her death, as the pioneering second part of this book shows, the legend of Joan has been invoked and her inheritance claimed by a remarkable variety of parties and factions of her countrymen, including both sides in the Dreyfus affair, and both Action Française and de Gaulle's Free

The point is neatly made by two of the admirably selected but very infrequently reproduced plates. In 1891 the church erected a statue outside the basilica at Domremy, Joan's birthplace. It showed the humble peasant girl kneeling before the saints from whom she received guidance. In 1902, on an equally prominent site near the d'Arc house - a statue of Joan appeared, on the initiative of the socialist leader Jules Ferry. Here, Joan stands erect, flourishing her sword with the aid of an idealized, but distinctly secular, representation of France.

But the order is significant. Voltaire had poked fun at the maid of Orléans, and although Marina War-

natural power. By imposing categories upon what is continuous in nature we create the possibility of anomaly. What refuses to be classified according to the scheme its world has adopted, straddling and living upon the margins of contrasted categories, is magic - powerful and dangerous, for better or for worse. Joan challenged the most fundamental of distinctions, those of sex and class. In doing so she compelled her contemporaries to regard her as a figure of unnatural power, fit to lead an army, or to be burned at the stake. That is why the representations of her by the English as witch rather than prophet, wanton rather than virgin, are more than mere counter-propaganda. They argued that she was not the divinely inspired figure that she claimed to be but its evil, diabolic, counterpart. That there could be no middle choice was inherent in her own claims and conduct.

Of all the images to which Joan laid claim the most powerful, of course, was that of virginity. Marina Warner's excellent discussion emphasizes in particular the name by which she always called herself - Jeanne la Pucelle. Pucelle meant a young girl, or a virgin, but not in the sense in which a nun would be called a virgin: *despuceler* was to deflower, and in the poetry of Joan's day the *pucelle* was the maiden whose virtue, under constant siege from knights and lovers, would in due course be conquered. It was an epithet which made virginity, that most marginal of conditions, as marginal as it could well be.

To the contradictions and ambiguities conjured by Joan's virginity there is no limit. Where nature demanded meekness she led; where it demanded modesty she sought display; where it demanded weakness she fought - and yet her virginity stood also for freedom and purity, and above all for independence. To all this, which Marina Warner shows so well, it is worth adding the question why only female virginity should have commanded this social value and power. The answer, obviously, is male dominance, and in that context the ambiguity, or marginality, of virginity is startling. The virgin represented the ideal image of the submissive female, innocent, meek, fit and ready to be disposed of in marriage by her male kin. But by the same token she was a woman still unpossessed - remember how many synonyms of colition are verbs of possession - and therefore still a source of potential danger as supremacy. To display virginity Joan did in a secular and public context, where male supremacy was represented in its most vital aspect, was to make it a symbol of extraordinary potency, reverberant with magical ambivalence.

All this is a great distance from the crofters' wives who made pires for Christina Lerner's commissioners. But perhaps not quite so far as it looks at first sight. Dr Lerner's typical witch is not only a woman. She is a woman with a sharp tongue, one who refuses to men, and especially men of higher social rank, the deference which they think they are due. These women also challenge the categories of their world, refusing to accept the helpless submissiveness which is their lot, though they do so in desperation, and not as a function of political activity.

Nevertheless they offered the most convincing symbol of disorder, of nature defied, in the small community, and were therefore the natural victims of those who wished to present themselves as the guardians of order, confirming their social power and proclaiming its legitimacy. How better to do so in a Christian plot, Dr Lerner's splendid book demands, than by leading a campaign to extirpate the enemies of God?

R. I. Moore teaches history at the University of Sheffield. His books include *The Origins of European Disunity*.

BOOKS

State of Denmark

Politics in Denmark
by John Fitzmaurice
C. Hurst & Co, £8.50
ISBN 0 903838 54 8

The level of ignorance in this country about Scandinavian politics (especially Danish politics), even among political specialists, is quite startling. As the Scandinavian countries are close associates of the UK in terms of geography, culture and economics, and are linked by political arrangements (and in the case of Denmark all these links are important) it would be useful for students of politics to know something about the Nordic group. John Fitzmaurice, who works for the European Commission in Brussels and is half-Danish, has provided a solid basic text which will be invaluable for courses on European government and institutions, and could well serve as a model for similar works on Finland, Norway and Sweden.

It is widely and inaccurately supposed in the UK that social democracy reigns triumphant in these northern climes. While it is true that the Social Democrats have been consistently in the ascendancy as either a majority or the largest party in Denmark, Norway and Sweden, all through the postwar period, politics in these countries has been much more complicated than this simple fact would suggest. There are systems of proportional representation, but large parties tend to be over-represented. This electoral characteristic has naturally tended to discourage the effective operation of minor parties and splinter groups until ten years within one or more of the larger parties (or widespread dissatisfaction with the collective failure of the parties to represent important interests) have led to a political explosion - as in Denmark in 1973, such a convulsion may take the form of a mass defection of voters to an existing party or, in an extreme case, may even lead to the creation of an entirely new party. The swings in fortune of the Liberals (*Venstre*), the Centre Party (*Senterpartiet*) and the Conservatives (*Høyre* and *Moderate*) in Norway and Sweden in the last two decades show that this tendency is not a purely Danish phenomenon.

Although Denmark is often depicted as one of the most stable and solid of all European states, the political changes of the last fifteen years have been even more remarkable than in the cases of her two close neighbours. The author has carefully examined in detail the new political developments which have stemmed from the cultural, social and economic pressures of the 1970s. Most importantly he has provided a convincing analysis of the enduring phenomenon of Mogens Glistrup's Progress Party.

In 1973 the Danish people revolted against the existing political system and the parties which supported it. The principal beneficiary proved to be the Progress Party, which secured nearly 16 per cent of the votes and, despite predictions of its speedy collapse, it still obtained 11 per cent at the most recent election in 1979. While in one sense the party is very much the creation and creation of its leader - who is a remarkably shrewd, skilful and charmingly witty man - it also represents deeply felt emotions of frustration among many Danes. The party believes in less government and fewer taxes and is also hostile to the excessive role played in politics by trade unions (all of which views explain why it won many votes from the traditional conservative parties), but it also opposes Danish participation in a formal alliance system and the deployment of nuclear weapons in Denmark (which are more conventional left-wing views). Although categorization of this party can be neither easy nor completely accurate, it is probably most useful to regard it as populist in character; a revolt against large organizations and

against the restrictions of choice which their existence and power have produced.

In addition to a very full discussion of the nature and role of the political parties the author has also looked carefully at the behaviour of important pressure groups, including the nuclear disarmament lobby, the anti-EEC movement and those organizations favouring continued integration within NATO and the West's defence system. At a time when similar lobbies are active in a number of West European states, including the UK, the author's comments and analyses are of interest to a wider audience than that merely of specialists on Scandinavia. Another area of current interest in UK political commentary is that of party alliances and the possibility of coalition government. Denmark is no stranger to these conditions and Mr Fitzmaurice has devoted considerable

attention to the problems of coalition between markedly different parties within a traditional framework of government, and in so doing has provided some answers to those who have doubted the ability of governments (and even democracy) to survive in a badly fragmented Parliament.

The author has thus produced an interesting and convincing blend of factual information, analysis and comment which should be read by all those interested in contemporary European politics, the problems of multi-party democracy or the difficulties of governing a country in a period of rapid social and economic change.

Paul M. Hayes

Dr Hayes is a fellow of Keble College, Oxford.

Stalin's victims

Within the Whirlwind
by Eugenia Ginzburg
Introduction by Heinrich Böll
translated by Ian Bolland
Collins, £9.95
ISBN 0 00 262366 8

This deeply moving book, sensitively translated by Ian Bolland, completes the story of 18 years out of the life of its author, once a history lecturer at the University of Kazan and a member of the Communist Party of the Soviet Union.

The first part of what Eugenia Ginzburg calls her "cruel journey of the soul" was told in *Into the Whirlwind*, published in English in 1967. In it she described her arrest in February, 1937, her imprisonment and continuous interrogation without food or sleep first for seven and then for five days.

Throughout her ordeal she protested her innocence and refused to sign any "confession". The Military Division of the USSR Supreme Court took just seven minutes to find her guilty of participation in a "Trotskyist terrorist group". Sentenced to ten years' imprisonment, she was held in solitary confinement until the ever-widening scope of the purges made that refinement of punishment in 1938 her sentence was "commuted" to forced labour in the camps of sub-Arctic Kolyma.

That first volume ended with her arrival at Elgen, one of the grimmest of the "islands" of the Gulag Archipelago. (Elgen, she was told, "is the Yakut word for 'dead'"). This second volume carries her story forward from the summer of 1940 to the spring of 1955. It tells of her life first as a prisoner and then as one subject to enforced residence in a remote area, and concludes with her rehabilitation two years after the death of Stalin, and her receipt of a certificate declaring her to be innocent "in the absence of any *corpus delicti*".

Eugenia Ginzburg began to write the chapters of her memoirs in 1959, three years after Khrushchev's denunciation of Stalin's atrocities at a closed session of the Twentieth Congress of the Soviet Communist Party. The re-affirmation of this denunciation at the Party's Twenty-second Congress in 1961 revived what she describes as "all my most impractical hopes" for her publication in her own country and she submitted her work to two leading Moscow literary journals. But the movement to eradicate Stalinism - from the outset partial and inconsistent - was checked; by the end of 1966 it was clear to her that all hope of publication must be buried. Meanwhile the number of typewritten copies in unofficial circulation through *samizdat* - the "D-I-Y" type of publishing network - was increasing in geometrical progression.

The Soviet authorities' refusal to sanction the publication of this book in the Soviet Union provides its own eloquent commentary on their failure to come to terms with the facts of Soviet history.

Eugenia Ginzburg's purpose is "to reveal to the reader the heroine's spiritual evolution", the gradual transformation of a naive young Communist idealist into someone

who had tasted unforgettably the fruits of the tree of the knowledge of good and evil, a human being who amid all her setbacks and sufferings also had moments (however brief) of fresh insight in her search for truth. "It is this cruel journey of the soul and not just the chronology of my suffering that I want to bring home to the reader", she writes.

Her first husband died in the camps; her first son died of hunger in the siege of Leningrad; her second, Vasily Aksyonov, joined his mother in exile after her release - a moment described in one of the volume's most memorable passages. He later became one of the Soviet Union's most popular novelists, one of those who voiced the hopes borne of the denunciation of Stalin's atrocities. He has now been obliged to live abroad - another eloquent commentary on the failure to come to terms with the past.

Eugenia Ginzburg describes atrocities, brutality and bureaucratic inhumanity; at the same time she tells of tenderness, sympathy and self-sacrifice. She tells of her love for a fellow-prisoner, a doctor of German origin, and of how they were married after their release, to enjoy a brief life together before his death in 1959, hastened by his suffering in the camps of Kolyma.

Eugenia Ginzburg herself died in 1977. Her story is a story of rare courage, a testimony to the strength of the human spirit. Her memoirs are a fitting memorial both to herself and to Stalin's other victims.

Dennis Ogden

Dennis Ogden is lecturer in Soviet politics and economics at the Polytechnic of Central London.

Epochal guidelines

On Political Realism
by R. N. Berki
Dent, £15.00
ISBN 0 460 04367 6

Appearance and Reality in Politics
by William E. Connolly
Cambridge University Press, £15.00
ISBN 0 521 23026 8

Dr Berki's work *On Political Realism* is a lively and highly interesting contribution to contemporary political philosophy. His viewpoint is fresh, his arguments shrewd, the background of reading he draws upon is impressive, and his writing intense, even passionate. He is splendidly dismissive of the second-order commentary on meanings and usages that so often passes for political theory in this country, and splendidly unapologetic about his high esteem for Hegel. His book is an antidote to academic parochialism, and a stimulant to rethinking the purpose and scope of political theory.

For Dr Berki political realism is not one branch of political philosophy, nor is it a political philosophy itself. In other words political philosophy is the only approach that is adequate to the reality of politics. It is contrasted with political idealism or ideology,

which takes a partial, one-sided and abstract view of politics. Dr Berki defines the two basic forms of ideology as conservatism and radicalism, the one being the ideology of nostalgia and the past, the other that of imagination and the future. The one tends to be the preserve of the old, the other of the young. Political realism by contrast is focused on the present, and is the preserve of the mature.

So far so good. But what is the reality to which political philosophy is adequate? For Berki the crucial factor is that politics is "inherently, irreducibly self-contradictory". It is characterized by oppositions. Ideologies are one expression of these oppositions. There is no getting rid of them. Indeed Berki goes so far as to assert that if there is such a thing as the "essence" of politics it is to be found in ideological clashes. Political philosophy must concentrate its attention on them and explain their necessity. But at the same time it must "transcend" them. Ideologists do not accept the necessity of contradictions and oppositions. Political philosophy must show them the foolishness of their ways. It must reveal ideologies to be, not wholes, but parts. A fair portion of Berki's book consists in fact of a critique of conservative and realist ideologies, a critique which, he claims, reveals that conservatism is radicalism, and vice versa.

Political realism or philosophy hence amounts to a double-sided critique of ideologies, showing them to be necessary and at the same time false. But what of all the other oppositions that characterize politics? How does political philosophy treat them? Here Berki, for all his frequent dialectical flourishes, seems to me to lapse into a fairly simple positivism. In other words the present, or the actually existing, is made into its own criterion for action. (The past and future, it will be recalled, have been appropriated by conservatism and radicalism). In the present "epoch", Berki argues, there are, as a matter of fact, a number of "epochal guidelines", namely "security", "happiness", "unity", "freedom", and so on. The task of the political realist is to adjust these "epochal guidelines" to "contain" political oppositions. Berki lists nine oppositions and suggests the mixture of "epochal guidelines" that are needed to contain them, but his arguments here, because of their contingent basis, lack compelling logical power.

This bare summary will perhaps give some idea of the main theme of the book. It can, unfortunately, give no idea of the constant provocative intellectual marching and countermarching that accompany its articulation, and make the book a pleasure to read.

Professor Connolly's book is a far more incoherent affair. The connecting nerve runs through seven chapters is a tenuous one, and the grand subjects to which they are ostensibly addressed belie the extremely limited way in which the author treats them. The book could have been more accurately entitled "random ruminations of a puzzled American socialist".

Connolly is puzzled because he is convinced that the real political world is a doomed "civilization of productivity", and yet he also recognizes that people still cling obstinately to the mores of this doomed civilization. He is puzzled because he believes that existing structures should be transcended and yet recognizes that the American citizen's wariness of received socialist ideology has some basis in reason. He is puzzled because he believes social scientists necessarily project anthropologies into their work, and yet is extremely tentative about the way in which the truth or falsity of a given anthropology is to be decided. In the end the mixture of an unquestioned assumption - we live in a corrupt world - with disconnected, convoluted and sometimes downright obscure conjectures about how we are to find our way about in, and our way out of this world, render the book both unsatisfying and wearisome.

Murray Forsyth

Murray Forsyth is reader in politics at the University of Leicester.

Styles of Toryism

Conservatives and Conservatism
by Philip Norton and Arthur Aughey
Maurice Temple Smith, £12.50 and £5.95
ISBN 0 85117 211 3 and 212 1

Conservatives and Conservatism is not as wide-ranging in scope as its title suggests, but is instead an account of the British Conservative Party, intended to provide "a comprehensive yet succinct analysis suitable for use in the 1980s".

As such it is a useful book, examining both the party's ideas and its organization. The authors give accounts of Conservative principles and attitudes, a short history of the party and descriptions of its organization, leadership and support. Their chapter on the electoral basis of British conservatism is a helpful guide to the academic debates about defence, *embourgeoisement*, and denigration among Tory writers, though it would have benefited from more precise definition of the crucial terms "working class" and "middle class".

Where conservative principles are concerned, Messrs Norton and Aughey recognize that within the overall consensus there are diverse and sometimes conflicting strands in the party's traditions. Their typology of "varieties of conservatism" distinguishes between "Toryism" and "Whiggism", the former referring to the more traditionalist, romantic, rural aspects of conservatism, while "Whiggism" comprises the liberal-capitalist, businesslike aspects. These two broad categories can, they suggest, be further divided. They provide persuasive sketches of four kinds of Tory - the pessimistic (for example, Angus Maude), paternalistic (Peregrine Worsthorne), progressive (Lord Butler) and combative (Mrs Thatcher) - and two kinds of Whiggism - corporate whiggery (Mr Heath) and neo-liberalism (Mrs Thatcher). As their inclusion of the Prime Minister in two of the categories indicates, they recognize that these conservative styles are not necessarily mutually exclusive.

One of the authors is himself a Conservative and their study is a sympathetic one, aiming to analyse the party "not by abstract criteria but according to its functions and the consciousness of party members". At one point, indeed, they maintain that outsiders, or even converts to Toryism, cannot hope to appreciate its delicate nuances and intricacies. Sometimes this approach slips into Burkean humbug, as when they counter the suggestion that the party is not internally democratic by dismissing "the mechanistic counting of heads and claiming that Conservative votes take into account 'not only the voices of the living but the views of past generations'". On the whole, however, the analysis is detached and non-partisan. Perhaps wisely, the authors do their best to steer clear of controversies over Mrs Thatcher's economic strategy, although it is possible to discern a certain sympathy with the "wets" in the course of the text.

As an attempt to provide a convenient and well-rounded account of British conservatism, then, the book is a success. However, the authors have another, more ambitious aim, namely "to trace the relation between conservative principles and conservative practice, how ideas find expression in party policy". If Dr Norton and Mr Aughey had elucidated this connexion their achievement would be considerable. However, they have not done so. Party organization, electoral support and political leadership are, as we all know, necessary conditions for the translation of ideas into practice, but describing them does not in itself explain "how ideas get turned into policy". To do that would have required a different kind of book, examining in detail the emergence of particular policies from a background of conservative principles via the organizational structure of the party.

Margaret Canovan

Dr Canovan is lecturer in politics at the University of Keele.

BOOKS

Stage fright

The Antitheatrical Prejudice
by Jonas Barish
University of California Press, £14.75
ISBN 0 520 03735 9

Prejudice against the theatre is ancient and deep-rooted. It has worked itself into the very language we speak. As Professor Barish remarks, theatrical, operatic, melodramatic, stage tend to be terms of abuse, and expressions like acting, play acting, playing up to and putting on an act are all coloured with the taint of falsehood and hypocrisy. Philosophers, critics, and preachers have lambasted actors as protean role-players who subvert the foundations of honesty and personal integrity, and theatres as sinks of corruption, likely to foment radical instability and frustrate the pursuit of the good life.

In surveying the mass of literature this prejudice begets Professor Barish has usefully tidied up a corner of the history of ideas containing much dust and rubbish along with some trenchant comment. His catalogues efficiently and summarily with admirable clarity, but he is concerned with more than academic recording.

The core of the quarrel is imitation: players seem to have no identity of their own, but adopt a bewildering variety of disguises, while plays "body forth" the forms either of things known which their critics would prefer to keep submerged, or of things unknown which seem to involve dangerous exploration. Barish's starting point is Plato, and it is the Platonic attack on imitation, so often coupled with a totalitarian insistence on undeviating roles which enable philosopher-governors to "keep" their citizen in his place, that serves as the connecting theme in the bizarre and confusing manifestations of antitheatrical prejudice from Plato to the present day. The chief opponents apart from Plato, are Rousseau and Nietzsche, the former a renegade from the theatre, the latter an apostate who turns from enthusiastic advocacy to hysterical denunciation. Both are artist-critics ambiguously drawn to the dramatic modes of presentation which they denounce. Indeed, the most interesting contributions to the antitheatrical case are found in works of art where such ambivalence is incorporated in the structure.

Thus Ben Jonson satirizes role-playing gulls in comedies like *Volpone* and *The Alchemist* while exalting admiration for their even more expert role-playing gullers, and Jane Austen puzzles her readers with her curious attitude towards amateur theatricals in a famous episode of *Mansfield Park*. Role-playing here no doubt acts as a test case for the integrity of her central characters, but the intellectual status of the test is curiously fudged and the play offered as peculiarly unsuitable for the innocuously sentimental *Lovers' Vows*. The later Jane Austen may have experienced an evangelical reaction from her own earlier taste for the family theatricals, but, as Professor Barish objects, even she "might have admitted, had she wished, that the skill she reprehended in Henry Crawford was one which she, as a novelist, could hardly do without".

On the pro-theatrical side Barish cites Neo-Platonists like Castiglione for whom a kind of theatrical display is a fulfilment of the self; Schiller, who so completely eliminates the mimetic principle as to claim that man "is only fully a human being when he plays"; and Baudelaire, who, with more than a touch of the theatrical tour de force in his own attitude, makes a virtue of theatricality as part of the artifice by which men attempt "to fashion something beautiful from their coarse and ugly selves". In an interesting reappraisal of Henry James's *The Tragic Muse*, Barish considers that novel as a positive defence of the theatre against the kind of prejudice given such weight in *Mansfield Park* (at the

risk, however, of underestimating James's own residual prejudice); while he enlists Dickens, George Moore and D. H. Lawrence (in *The Lost Girl*) as demonstrators of the psychologically liberating potentialities of the theatre.

The twentieth century he sees as a period in which anti-theatricalism in its grosser forms has largely disappeared, and yet has been reconstituted within the theatre itself. Shaw and Pirandello attack the self-bred clichés of the theatre, using methods which are nevertheless a theatrical form of debunking, and the most extreme development of "the theatre against itself" is Peter Handke's *Offending the Audience*, which turns the actor-audience relationship upside down, making the actors resolutely non-mimetic and the audience cliché-bound performers.

Barish recognizes that this is something of a dead-end; but it does not seem to worry him as much as it ought that the theatre should carry the burden of its own criticism in this way. If anti-theatricalism is a form of self-defence by society against what it fears in a vigorous, living theatre, the absence of external anti-theatricalism may well mean that attention has passed on elsewhere, in which case attacking the audience is little more than the theatre biting the only hand left to feed it.

The obvious successors in the contemporary world are cinema and, more especially, television; yet the only one of Barish's authors to mention the cinema is Lawrence, while Barish himself makes just three scattered references to television. Perhaps another volume is required for the anti-cinema and anti-television prejudice, or perhaps it is too soon to study them in historical perspective. Meanwhile one is left wondering if the demise of anti-theatrical prejudice in the world outside, and the desperate internalizing of such prejudice within the modern theatre, is not so much a sign of wisdom and tolerance as of indifference on the part of the general public. If so, this excellent book may well be a kind of theatrical obituary.

R. P. Draper

R. P. Draper is professor of English at the University of Aberdeen.

Dante in Dublin

Joyce and Dante: the shaping imagination
by Mary T. Reynolds
Princeton University Press, £13.90
ISBN 0 691 06446 6

No writer was more important to Joyce than Dante, whom he called "the first poet of the Europeans". None offered a more congenial creative precedent on which to base his own work: the long exile, the epic sweep of the imagination, the controlled arrogance, the lacerated concern for the native place, the delight in words and the skill in their manipulation, the fascination with elegant structures, the interrelating of multiple meanings. A full-length study of Joyce's remarkable involvement in Dante has long been overdue.

A committed and careful reader of both Mary Reynolds sets against her task methodically. She writes with cultivated assurance, quietly but persuasively illuminating many passages where readers might not have suspected the relevance of Dante. That Bloom and Stephen set off in *Bumens* making "tracks to the left" is attributable not only to the topography of Dublin but also to the antecedent example of Dante and Virgil in the *Inferno*. Bloom's trumpeting at the end of *Sirens* properly echoes the end of *Inferno* 21. Unlikely though it may seem, Stephen's scene with Wells in *Stephen Hero* is probably a rewriting of *Inferno* 16.

Sometimes, however, the arguments are unconvincing, the parallels weak and unhelpful. Arltiffon's use of the word "bestia" in *Wandering Rocks*, does little to prove that he plays the role of Brunetto (who uses the word "bestia" in *Inferno* 15). The Italian language of "He thought

that he thought that he was a Jew whereas he knew that he was not" is hardly an "unmistakable" echo of the famous line at *Inferno* 13:25: "Cred'io che 'l credene ch'io credesse".

Occasionally the details of the exposition are less cogent than the general propositions. While Mary Reynolds is surely right to find an intriguing parallel between Lipoti Virag and Cacciaguida, she protests too much when she asserts that "chutes rapidly down the chimney flue" is "a visual effect suggesting both the coal and the flame of Dante's *terzina* 'si come carbon che fiamma rende'".

Elsewhere one could wish that Mary Reynolds had taken her analysis further. While having much to say about the parallel between *Inferno* 5 and *Ulysses*, she misses the opportunity to compare the *dolce stil nuovo* with the outmoded musical seductions of "Love's Old Sweet Song". When tracing Joycean versions of the Dante-Beatrice relationship she says: "The Stephen of *Ulysses*... has no Beatrice. His acute sensitivity to emotional impressions shows itself primarily in his reactions to his mother's death, through which the reader is made aware of Stephen's capacity to love. Apart from this... Stephen is represented as loveless."

There she leaves the matter, failing to follow through the painful consequences of Joyce's inversion: May Dedalus appears to Stephen in Circe, not glorified but emaciated... green with grave mould"; she reproves him, urging repentance; Stephen refuses to follow Dante's example. Here is "love's bitter mystery" indeed.

Structural and architectonic matters are handled in a strikingly uneven and often hesitant manner. Both Joyce and Dante delighted in symmetries, antitheses, patterns, and shapes. Building on the work of Hans Walter Gabeler and others, Mary Reynolds points to the chiasmic structure of *A Portrait* and makes some penetrating comparisons with the structure of the *Vita Nuova*, emphasizing in particular the relationship of the centres of each. The argument nevertheless remains only partially developed, as it also does when she suggests a new pattern of correspondences between the stories of *Dubliners* and the circles of Hell. Her table of equivalences between the sins of the citizens of Dublin and Florence is unsatisfying because too loose, too tentative, and therefore un-Joycean. She is still more tentative when she suggests, in passing, a possible relationship between the three parts of the *Divine Comedy* and the three of *Ulysses*, giving this matter of formal balance - of vital significance to both authors - almost no serious attention. The reflection of the canons of the *Comedy* in the episodes of *Ulysses* deserves a more probing analysis.

In a long appendix Mary Reynolds traces allusions to Dante in Joyce's work, all of Joyce's published works including the *Critical Writings*, *Giuseppe Joyce*, the poems, and the letters. Better designed than most such catalogues, the list of attributions is supported by frequent reference to the manuscripts and typescripts, several pages of which are helpfully reproduced in reduced facsimile. By following Joyce through the processes of emendation and addition it is often possible to prove the presence of Dante in passages where it might otherwise seem doubtful. Mary Reynolds offers some brilliant examples of such analysis. There are nevertheless a number of passages where the case for the relevance of Dante seems weak. Similarities of subject matter and even congruences of language are inevitable when one compares the major works of two such cosmographic writers. The appendix would have been more useful had Mary Reynolds chosen to focus only on examples of undoubted likeness.

I wish I could be more enthusiastic about this important study. Mary Reynolds has given us much to think about and has enriched our understanding of many details of Joyce's work. If her book remains less than wholly satisfying, this is partly owing to some degree of impermanent mismatch between the author and her subjects. Although she quotes



Picasso's "Seated Old man with Hat", which was seen last spring in the Royal Academy's "A New Spirit in Painting" exhibition. It is reproduced in the Royal Academy of Arts Year Book 1981-82, published in association with Alden Ellis at £12.50.

approvingly Joyce's comment "If *Ulysses* isn't fit to read, then life isn't fit to live," she is ill-at-ease in the world of Bloom and Stephen, which she can accept but not wholeheartedly celebrate. She makes unduly heavy weather of Molly's encounter with Boylan, calling it "the very nadir of lust", and has to talk her way out of comparable bothers with Dante.

When his imitative passages become grotesque he may be accused of failures of taste and lack of discriminating sensitivity. But the greatest artists are those who draw from life, as Dante drew Cacciaguida, and these artists are not over-concerned with taste.

Her book would have been more rewarding if she herself had been less concerned with taste and had been better able to give herself freely, as Joyce and Dante did, to the varied experiences of the worlds they imagined.

Clive Hart

Clive Hart is professor of literature at the University of Essex.

A sense of adventure

Disraeli the Novelist
by Thom Braun
Allen & Unwin, £10.00
ISBN 0 04 809017 4

Archibald Tait, Archbishop of Canterbury, expressed the orthodox earnestness of his period when he remarked that he had finished reading *Endymion* (1880), Disraeli's last completed novel, "with a painful feeling that the writer considers all political life as mere play and gambling". Many Victorians felt the same about the witty, intelligent, resilient Jew who, as Dr Braun shows, abandoned the gorgeous waistcoats and dandified manner of his wild youth when he had established himself as a leading Conservative politician, but remained something of an exotic enigma to the last.

Braun takes as his theme the "play" and adventure of Disraeli's politics and the way in which the "play" and romance of his fiction complement his political life. Questions of "sincerity" are irrelevant; what Disraeli imagines becomes, for its duration, his reality. Braun sees Disraeli's view of the past, including his own, as an attempt to "give it

order and purpose. Particularly valuable is his scrutiny of Disraeli's tidy explanation, in the 1870 preface to the collected edition of his novels, of the genesis of the Young England fiction - *Coningsby* (1844), *Sybil* (1845), *Tancred* (1847) - compared with the pragmatic and chaotic writing of the books.

He goes to the heart of Disraeli's fascination as a novelist when he indicates the tension between fact and fiction in *Coningsby*. The "day-dreaming" quality which Braun identifies in Disraeli's imagination produces, for example, Lord Marchmont's glittering world which, despite the absurd self-congratulatory knowings of the narrative tone, embodies hard realities of political power and activity. Strangely, Braun denies politics their central place in Disraeli's fiction, arguing, rightly, that the Young England novels are not "about the forming of cogent policies, or the administration of states". But, as he says, "the basic sense of adventure" coloured all Disraeli's enterprises and for him the greatest adventure of all, combining action and ideals, was politics; they are embodied, not simply mentioned, in everything he wrote, fiction and non-fiction.

Braun indicates many helpful ways of approaching Disraeli's fiction and compresses a great deal into a short book, but he evidently finds such confinement hampering to the full expression of his theme. Such a statement as

"His ever-present obsession with manipulating events and ordering experience and dividing issues into clearly defined dichotomies is perhaps a strong reason for criticising his political as well as his novelistic achievements" - is tantalizingly cryptic. Moreover, there is no space to explore the way in which Disraeli's politics as well as his fiction were "Romantic", nor to examine his considerable debt to Byron. Perhaps the hurry of producing a short study of marking the novellist in the year marking the centenary of his death is responsible for the occasional inelegancies of Braun's style.

Dr Braun obviously has the ideas and the materials to write a more comprehensive study of Disraeli's politics and fiction; it is to be hoped that he will be given the chance to produce it before long.

Sheila M. Smith

Sheila M. Smith is senior lecturer in English at the University of Nottingham.

BOOKS

Swing, swing, together

Athleticism in the Victorian and Edwardian Public School: the emergence and consolidation of an educational ideology
by J. A. Mangan
Cambridge University Press, £25.00
ISBN 0 521 23388 7

J. A. Mangan concentrates on the development of football and cricket, rather than on public school athletic activities, and deals only with boys' schools. What interests him as a historian of physical education is how a cult of team games was fostered in the Victorian public school to form the basis for a "once powerful ideology". He offers a lively and sometimes provocative explanation based on a systematic examination of school archives, including school magazines, the details from which fill out the text with "data" and anecdote, and spill over into six appendices. Apart from the Catholic Stonyhurst, the schools chosen - Harrow (the "great" school), Marlborough (proprietary), Uppingham (elevated grammar), Lancing (Woodard), and Loretto (private venture) - were all overtaken by an excessive and ostentatious philathleticism from the 1850s.

It is not entirely clear from this account why "football" and cricket were eventually preferred to other "manly exercises". The initial idiosyncratic versions of them were only as elements in the "athletic sports system" introduced by ambitious headmasters to better control and organize the leisure time of boys in the interests of discipline and the school image. The answer seems to be that team games could be more easily justified in terms of the public school goals of character formation and "esprit de corps"; and when the best schools made them compulsory others followed for reasons of social emulation. Yet those headmasters who were representative of Victorian "muscular Christianity", with a strong belief in the educational value of physical activity, such as Thring of Uppingham and Almond of Loretto, posited with a much wider programme than games and Thring, along with the later headmasters of Marlborough, unsuccessfully attempted to stem the tide of athletic excess.

Why then did the cult of games catch on? The springs of emotional support came from boys who thrived on the hedonistic and anti-intellectual spirit of games. They were encouraged by enthusiastic masters who gave practical help and financed the provision of facilities for reasons both of idealism and opportunism - the "games-playing" housemaster, for instance, had a vested interest in competitive games because they helped to uphold a system on which his own income largely depended. There were pressures too from parents who recognized the social returns, and from the universal lack of generations of sporting "blues". But the key aspect of Mr Mangan's explanation, and the most interesting part of this work, concerns how the playing of games became integral to the way the schools functioned as "total" institutions with power to evince loyalty and strong emotions. He argues persuasively that an elaborate system of symbolic activities and ritualistic forms of behaviour came from the playing of games, which ensured conformity - so that the studios had to fag on "morally" expressed and reinforced "unifying cultural values" and that the schools became "total" institutions. This was the significance of the public school common games, old boys' teas, and the Cockhouse, Cup, model house, and colours, and "bloods". These values were reiterated in a

proliferating "literature of athleticism" embodied in school songs, sermons, magazines, and the sporting prosody of old boys, whose rhetoric sent out "messages of loyalty, masculinity, chauvinism and decency" that not only legitimized the cult but defined the meaning of school life.

A limitation of this book is that few references are made to the evolution of team games in British society at large, so there is really no context for assessing the cultural impact of the public school emphasis. As an institutional study, however, it certainly adds a further dimension to recent work not merely in correcting the "oversimplifications" of the public school historians, as the author too frequently claims, but in using concepts and techniques more usually associated with anthropological studies to illuminate the inner workings of the private and insular world of the public school in its heyday.

David Reeder

Dr Reeder is senior lecturer in education and urban studies at the University of Leicester.

Human investment

Education, Labour Market and Human Capital Models: Swedish experience and theoretical analyses
by Ase Sahlman
National Board of Universities and Colleges, Stockholm
ISBN 91 7146 140 X

The notion that education is connected with economic performance is an old one. It is related to the rather narrower proposition that education is conducive to economic growth, and within that to the even narrower formulation of human capital theory. The suggestion that investment in human beings could be examined in terms appropriate to investment in plant and machinery had its heyday in the 1960s and early 1970s. Since then it has been undermined by the decline in the economy (especially in its underlying growth rate) coupled with the expansion of the education system: the average educational input of a UK worker has risen without an obvious improvement in economic efficiency. The point seems to hold a *fortiori* for management. The view current twenty years ago, that founding a couple of business schools would be of great help, would now be derided.

But, having said all that, one is reluctant to accept the opposite viewpoint, that education has nothing to do with the level and growth of our economic potential. More education as such need not necessarily be helpful, but surely some kinds of education can be more conducive to economic efficiency than others. Moreover, there are aspects of the capital investment analogy that are most persuasive. One is that the costs and benefits of this particular kind of investment must be seen as flows over time. A second is that the capital investment may become obsolete and need renewal. Thirdly, the scale and structure of the investment goes so far as to question the whole that occurs will depend on its method of financing, and especially the extent of public support involved.

A large part of the present book is of a theoretical nature, exploring the human capital approach, and reviewing a vast literature. The exposition of this literature is extremely clear, but perhaps rather too mathematical for the general reader. However, the expert and the specialist student will be most grateful to Dr Sahlman for this survey, since it will help them to decide which of the original articles are actually worth reading. Above all it provides a perspective of the whole field.

What primarily emerges from this survey is the domination of the field by America, an even stronger domination than is evident elsewhere in economics. This is related to a second point, namely the human capital theory is part and parcel of the neoclassical approach to economics. For the most part, a student of this literature would assume that Keynes had never lived, and the

macroeconomic problems of disequilibrium and market failure were non-existent. Thirdly, while accepting that theory to be useful must be abstract, there are limits to the extent of the appropriate abstraction. Surely an applicable theory must be capable of comprehending reality. An educationist reading this book would say that the assumptions made are simply too far from reality to lead to valuable conclusions. (I hasten to add that the fault lies not with Dr Sahlman, but with the economists whose work she is dealing with.) The theory typically assumes that school decisions are taken by individuals confronted with a great deal of relevant information and possessing the intelligence to use it. They are supposedly free to make choices between work, leisure, and education along continuous dimensions. Moreover, the outcomes of decisions are not noticeably different from the expectations. All of this happens within an economy possessing a steady state growth path to which it tends all the time.

Fourthly, the theory illustrates beautifully that besetting sin of economists - the can-opener approach. (Economists on a desert island with a can of food but no opener solve their problem by assuming they have a can-opener and then consider what to do next.) If, for example, ability is relevant to education, then one defines a variable, "A", includes it in the functions postulated and analyses the consequences. The same goes for social class, "S", sex, "M", or "not M", and so on. Above all, if many workers operate in circumstances in which output is not easily measurable, one assumes that it is, and sees what happens next.

Special cases

Educational Subnormality: a study in decision-making
by Sally Tomlinson
Routledge & Kegan Paul, £12.50
ISBN 0 7100 0697 7

Several factors contribute to a child's being transferred from an ordinary school to a special school for ESN (M) (mild educational subnormality), but the overwhelming reason for transfer is functional: A child is not thriving. In most cases the transfer to a special school is not a matter of categorization but rather a recommendation for a particular special school, many special schools are able to offer individual programmes of literacy, numeracy, work experience and careers advice often not available in ordinary schools.

This study argues that the existence of special schools for ESN (M) allows for the removal of potentially troublesome children from the normal education system. Among these, children of manual working-class and especially of West Indian parents are over-represented. Thus, Dr Tomlinson sees that this type of special school may be interpreted as providing the opportunity for some sort of social control in an increasingly complex and technological society, and goes so far as to question the whole of ESN (M) and the ways in which professionals decide which child is in need of special education.

This is an excellent and much needed empirical study of the decision-making process, which involved interviewing a study population of 40 children, their parents and all the professionals involved in making the decision. The 40 children came from three child guidance clinics in Birmingham and had all been assessed for special educational needs. Dr Tomlinson was in the process of being assessed as in need of special education. Interviews, included in the appendix, are both at a general and a particular level and the book provides a wealth of data from which it is possible to gain insight into the process of assessment for special education.

Dr Tomlinson looks in detail at the roles of referring headteachers, educational psychologists, school medical officers, special school heads and the criteria they use for deciding which children are in need of special education. She finds that headteachers of both types of school use

I am not arguing that human capital theory is, therefore, a waste of time, but that it should certainly be handled with care, and that it is not obvious how necessary it is. In the first half of this book Dr Sahlman examines the Swedish labour market and educational system from a generally economic standpoint. This is applied work of high standing. It is full of fascinating insights into the different employment experience of men and women, and of such topics as the possible ways in which education may have impeded the operation of the labour market. We are reminded of how much extra education has been expended on the present young compared with previous generations. Although Sweden is often regarded as a social democratic paradise, full comprehensive education and equality within the system has not yet been achieved. Plenty of inequality remains, and is not uncorrelated with social class.

These and other matters do require further theoretical exploration. One of the best parts of this book is, in fact, Dr Sahlman's discussion of how her study should proceed. Perhaps it was inevitable that the first step should be in the direction of human capital. It is to be hoped that in subsequent research she will take the next step, and extend the theory in a relevant form, taking into account that what the neoclassical economist terms "imperfections" actually comprise the real world.

Maurice Peston

Maurice Peston is professor of economics at Queen Mary College, London.

predominantly functional and behaviour criteria, whereas psychologists use functional and statistical criteria and reject behaviour criteria, and school medical officers use social criteria. Not surprisingly, there is sometimes conflict among the professionals and little agreement on objectively defined criteria for the designation of a child ESN (M). Following on from these findings, Dr Tomlinson questions the epistemological status of the concept of mild educational subnormality and proposes instead that the category is being used as an administratively convenient way of disposing of those children who do not fit in with the norms of ordinary school.

The background to this research is sociology and race relations; it is unique in being a study within the sociology of special education. But the question of where and how to educate an individual child is rarely best answered from a sociological or political standpoint. Teachers and professionals deal with individuals, sociologists usually with groups. When a child is failing in ordinary school, there are three alternatives: change the child to fit the school, change the school to fit the child or remove the child. This is a practical and an educational problem. Professionals use the provisions available to find an environment which will best cater for the needs of an individual child. This is not the place to discuss the implementation of the recent Warnock report on how ordinary schools could be adapted to meet the widely varying needs of all their local children. Nevertheless, researchers need to be aware of the dangers of categorization and discussion of the needs of groups rather than individuals.

Dr Tomlinson has provided a valuable case study and analysis of the decision-making process of interest to those engaged in education. It is sometimes difficult in such research to resist the temptation to draw sociological rather than educational conclusions.

Ingrid Lunt

Ingrid Lunt is an educational psychologist.

The Autumn 1981 number (vol 35, no 4) of *New Universities Quarterly* includes a Socratic dialogue on selection for higher education by H. P. Rickman, and an article by John R. Durant entitled "The Myth of Human Evolution". There are also two articles by John Bowley together with an open letter addressed to Bowley by Barry Richards.

Another American dream

The Classroom Society: the construction of educational experience
by Herbert A. Thelen
Croom Helm, £12.95
ISBN 0 7099 2402 X

Herbert H. Thelen is emeritus professor of education in the University of Chicago, and this his latest book is part of the publisher's "Curriculum Policy and Research" series. The series editors welcome his contribution to the framing and answering of "the critical questions about our schools. How close are they to our sense of what they might be?" To answer this it is necessary to demonstrate how "schools" are, and to be explicit about the way they might be, recognizing that the first requires research and the second the acknowledgement of value judgements. Thelen disapproves on both counts.

There are two accounts of original research. In the first, 900 eleventh-grade high school students rank ordered 24 statements, invented by Thelen, according to the way they described their particular school class and their "ideal" class. The statements are not presented in their entirety and the method of analysis is not described. Not surprisingly, "satisfied" students showed a fit between the ideal and the experienced.

If Thelen is at all well known in this country it is for his advocacy of "teachability groups", and the second project (from 1967) reports an experiment in matching teachers with students according to their intellectual compatibility based upon their completing a 405-item battery of classroom related attitudes, preferences and associates. Students and teachers in teachability groups reported slightly more satisfaction with relationships than those in control groups, where achievement was generally better. The "classroom society" revealed in these slender studies is a long way from those in American schools observed and described by Silberman, Rist or Jackson, none of whose books are mentioned. Despite the British Library Catalogue there are no references to British education at all.

These researches form the basis of Thelen's propositions about the way things should be, the largely implicit value judgment being that education must satisfy the imputed preferences of the students. This is elaborated and justified by incorporating arbitrary elements of psychological and biological theory, such as Bion on group dynamics and La Barre on adaptation, in the construction of "models" and "paradigms", such as ALP (authenticity, legitimacy and productivity), the elements of which should be maximized in educational practice, drawing upon the remote original scientific sources as spurious justification. The language of these sections is a curious mixture of the portentous "underlying the quest of the species - adaptive life is the individual's intuition that he is part of the history and destiny of the human animal", and the slangy, "Youngsters may judge a course to be a drag and the teacher a drip".

Perhaps these criticisms are not justified because an appropriate kind of response to this sort of book is an emotional one: does the reader feel Thelen is right? Who isn't for the compassion, enlightenment, human dignity and beautiful experiences he wants education to provide? Would these, he hopefully speculates, help "make the Great American Dream a reality"? Thelen's book is an American dream in itself - remote from real classrooms, and from political and material exigencies. But perhaps we need educational dreams.

Ronald King

Ronald King is reader in education at the University of Exeter. His books include *School Organization and Pupil Involvement* and *School and College: studies of post-sixteen education*.

BOOKS

Trekking across Brazil

Developing the Amazon
by Emilio F. Moran
Indiana University Press, £13.50
ISBN 0 253 14564 3

More concerned as it is with settlement than development, this book concentrates on one particular colony rather than with the Amazon basin as a whole. Consequently, there is little about the big capital developments that are transforming Amazonia since President Médici launched the Programme for National Integration (PIN) in 1970. There is no discussion of the huge iron ore and bauxite mines, the hydroelectric dams, the attempts to discover oil, aerial radar surveys, the Jari and other vast agribusiness and timber experiments, or of traffic along the new roads being cut through the forests by Brazil and her neighbours. Having established that this book's title could be misleading, its virtues can be told. It describes a period of brilliant field study in the new *agrovila* of Vila Roxa a few kilometres west of Altamira on the lower Xingu. The author was at Vila Roxa in 1973-74, soon after this section of the Transamazon Highway was built and the first settlers arrived. Being involved at the outset of this remarkable experiment in planned migration, Professor Moran makes observations that would be valid for similar colonies in other parts of the Amazon forests; but his research may already be out of date for the place he studied.

Emilio Moran is an anthropologist, but with strong geographical and geographical awareness. One of the most valuable contributions of his book is an assessment of the potential of different types of soil for farming or cattle-ranching. He praises indigenous slash-and-burn agriculture, but dismisses as far too sweeping the generalization that the annually flooded *várzea* riverine lowlands have greater fertility than the higher ground between rivers. Even within the limits of his one settlement there were radical differences in soil types and consequent agricultural potential. Each pioneer settler was awarded a 100-hectare plot. Professor Moran records how different farmers tackled their different types of soil and assesses their results. His description of the agricultural calendar and the chemical processes involved in burning off felled forest should be required reading for the young agronomists sent out to oversee UNICRA and other government settlement agencies. So also should his interesting data on the amount of protein acquired by hunting and fishing and the way in which new pioneers lose their fear of the forest and learn to hunt - waiting in hammocks at baited hides for most nocturnal game but tracking in teams for peccary.

As an anthropologist, the author is particularly perceptive to watching the emergence of class and social groupings in an artificial new settlement. He notes the gulf between the pioneer farmers and government officials. The Brazilian government established good programmes of health, education and social and agrarian assistance along the Transamazon highways. But the well-intentioned administrators of these programmes rarely shed their urban styles of dress, transport or behaviour. As a result, they remained aloof and failed to gain the trust or to influence the settlers who were supposed to help; and they also failed to appreciate much of the skills and experience possessed by their charges.

Professor Moran makes important observations about the *caboclos* - pioneers who were already established in Amazonia for generations before PIN, or who moved in large numbers from one part of Amazonia to the new settlements. Planners and

bank managers wrongly assumed that settlers from southern Brazil were more efficient than those from the north-east or centre-west.

The *caboclos* knew which types of forest grew on the best soils, but no-one thought to consult them. Some who had already created clearings before the arrival of the roads were ignored and lost their land in arbitrary allocations; and they were often unfairly treated in awards of bank credit. Contrary to official expectations, almost half the settlers in Vila Roxa came from other parts of Amazonia; and of those from the south and centre-west, many were north-easterners who had previously migrated unsuccessfully to southern Brazil.

The second half of the book gives an anthropologist's view of an emerging society, with the new settlers adopting richer traders or developers as godfathers or unofficial bosses. Government social workers had limited success organizing football matches and bingo. But the most successful social function was a spontaneous move by the farmers themselves to choose a patron saint and raise money for his statue through a cattle auction. There is a fascinating chapter on disease: not only a factual summary of incidence and days lost through different diseases, but a picture of the settlers' own perceptions of their ailments - based on concepts of hot or cold bodies or thin, tired blood - and their folk remedies.

The strength of this book is in a mass of information, carefully observed and presented in clear tables and diagrams. It also lies in the author's obvious ability as a fieldworker who won the confidence of and is in sympathy with all the people in the fledgling community he studied.

John Hemming

John Hemming is director and secretary of the Royal Geographical Society.

Legacy of astronomy

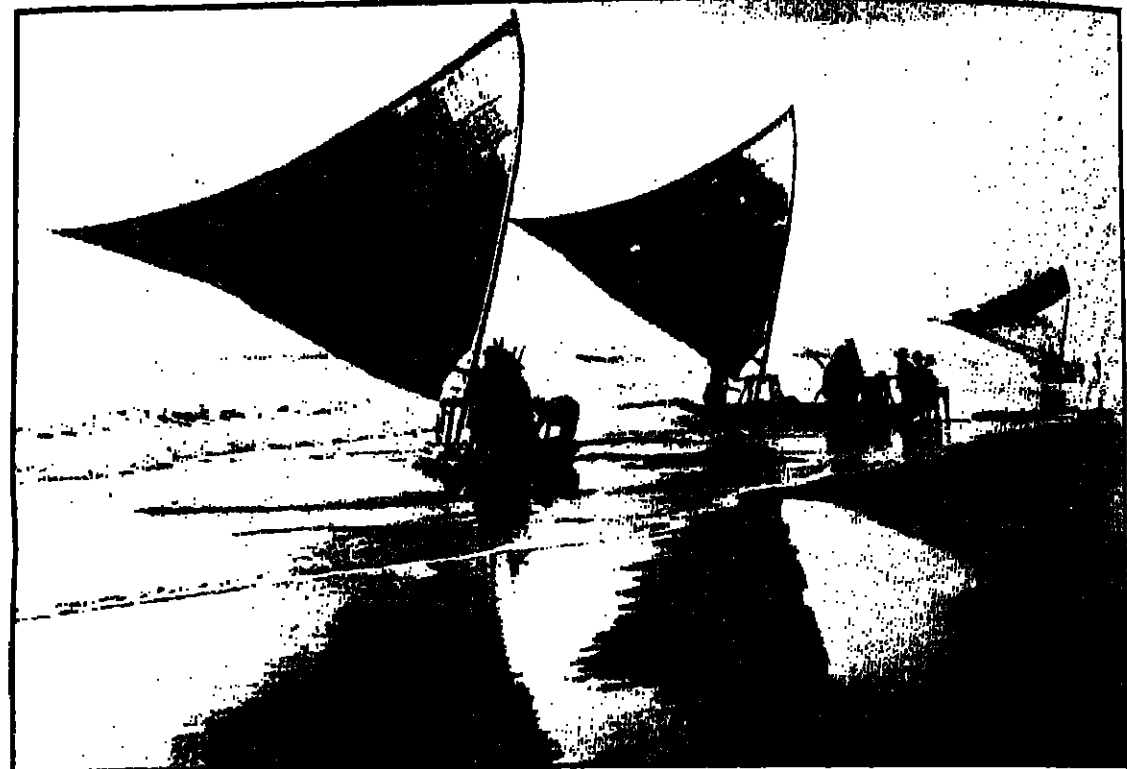
The First Stargazers: an introduction to the origins of astronomy
by James Cornwell
Athlone Press, £7.95
ISBN 0 485 30004 4

The First Stargazers ought really to bear the epigraph, "To everything there is a season, and a time to every purpose under heaven." For it proposes that the time for accepting archaeoastronomy as a proper academic study has finally arrived.

What does "archaeoastronomy" encompass? Cornwell quotes the following definition: "archaeoastronomy is the study of the astronomical practices, cosmological systems and celestial lore of ancient and pre-technical peoples by means of their material legacy". The emphasis is therefore especially, though not solely, on prehistoric cultures. Despite the book's title, Cornwell's principal concern is with the Sun, Moon and planets. Stars do appear; but little is said, for example, about the origins of the constellation patterns as discerned by different cultures.

Now one of the interesting points of archaeoastronomy, so defined, is that its present efflorescence represents a second blooming. At the end of the nineteenth century, ancient monuments were already being assiduously surveyed, and scientists were astonished archaeologists with their deductions concerning the astronomical capabilities of our remote ancestors. Cornwell describes some of this work, but mainly in the context of the superiority of modern studies. He does not really consider the fundamental question - What basic difference, if any, is there between the present burst of activity and those past efforts? And then, depending on the answer - will the new interest die away, as the old one did? He certainly records striking changes in approach. For example, the ubiquitous computer can now be used to search for every alignment of a monument that might have a conceivable astronomical significance.

But are the hesitations of the archaeologists necessarily wrong? After all, the real question is not whether our ancestors were reasonably intelligent, but what knowledge



Jangandas, primitive fishing craft, at Praia, Ceará, in the Brazilian Nordeste. Taken from Arthur S. Morris's *South America*, the second edition of which has been published this week by Hodder & Stoughton at £6.95.

But this hardly represents a major conceptual advance. A comparison with the older writings on the subject suggests that, where conceptual differences can be found, they are generally in the more disputed parts of the subject. An example is the possible significance of Stonehenge for predicting the occurrence of eclipses. As Cornwell says: "Debate on the ability of prehistoric man to compute eclipses will continue, no doubt, through the lifetime of the current debaters and beyond".

If important conceptual advances have been few, the exploration and surveying of potentially valuable sites has grown beyond recognition. The chapters in *The First Stargazers* are mainly divided up in terms of geography, giving a good impression of the way in which archaeoastronomers have swooped on interesting sites all round the world. The author devotes special attention to North and South America, reflecting not only his own background and nationality, but also the high level of enthusiasm for archaeoastronomy in the United States.

The text is entirely non-mathematical, so one of the more interesting aspects of modern studies - the application of statistics - is only mentioned briefly. Some would see statistical analysis as providing the essential core of the subject, even if its methods are incomprehensible to many people in the field. Yet such analysis has not to date led to any really clear cut conceptual breakthrough. This seems to be due partly to the intrinsic uncertainties of some of the measurements (how is an "alignment" actually to be defined?) and partly to the complexity of the questions being asked. An example of the latter might be - is it possible from present-day surveys of stone circles to deduce whether or not they were laid out with a standard measuring rod?

If statisticians play only a minor role in Cornwell's account, archaeologists figure more prominently, though also less happily. Cornwell sees the leading spokesmen of archaeology, especially in Britain, as being excessively "conservative" in their acceptance of archaeoastronomy. The basic assertions, he says, which they must learn to accept are that, for prehistoric people, astronomy played an important, indeed central, part in their lives but it was fully integrated, not a specialized activity such as we associate with today's academic pursuit of science; prehistoric astronomy was practical, immediate, and direct; and perhaps most important, the experience of watching, recording, measuring, and predicting led to the development of cognitive abilities that may have laid the foundation for the development of other technologies.

But are the hesitations of the archaeologists necessarily wrong? After all, the real question is not whether our ancestors were reasonably intelligent, but what knowledge

are we forced to allow to preliterate cultures in the light of their material remains. The earlier development of archaeoastronomy petered out, in part, because however plausible the conjectures, there was still no compelling reason for a sceptic to accept them. Is the situation different today? The existence in prehistoric times of a general interest in astronomy would be widely acknowledged now, but many of the detailed interpretations are still in dispute. Despite the extended investigations of the past two decades - of which Cornwell gives a very readable account - archaeoastronomy has, perhaps, not yet entirely established its credentials.

A. J. Meadows

A. J. Meadows is professor of astronomy and history of science at the University of Leicester.

Tectonic revolution

Chance, Change and Challenge
Volume 1: The Evolving Earth
edited by L. R. M. Cocks
Cambridge University Press, £30.00 and £10.50
ISBN 0 521 23810 2 and 28229 2

The Darwinian revolution in biological evolution in the mid-nineteenth century can find close parallels in the plate tectonic revolution of the Earth sciences in the middle of this century. It thus seems singularly appropriate that the British Museum (Natural History) should produce two volumes, celebrating its own centenary, one dealing with biological evolution and one on the evolution of the Earth. They are, in fact, intended to be closely complementary as the book reviewed here is supposed to concentrate on the aspects of its subject that are particularly relevant to biologists, although it also aims to provide a more general dissemination of specialist ideas.

The book is divided logically into five parts, starting with the origin of the Earth and life forms on it, progressing through the formation of the continents, oceans and atmosphere to consider plate tectonic understandings of the development of the Earth during the past 200 million years and palaeogeographical views of the Earth during this period. Each section is preceded by an introduction and then divided into separate chapters, mostly written by members of the staff of the museum, making a total of 15 chapters.

As is common with most multi-author books, there is considerable variation in style. Such variability is not detrimental to the book as a whole but seems to reflect an uncertainty among the authors as to the audience for whom the book has

D. H. Tarling

D. H. Tarling is reader in palaeomagnetism at the University of Newcastle upon Tyne.

BOOKS

MATHEMATICS AND PHYSICS

Nature's unity

The Nature Of Matter
edited by J. H. Mulvey
Clarendon Press: Oxford University Press, £8.95
ISBN 0 19 851151 5

A recipe for an ideal lecture course might be as follows: find a subject that has some connexion with the birth, death and nature of the Universe, get half a dozen world famous physicists to talk for an hour apiece on their own perspective, add to these a couple of Nobel laureates, and ensure that your chosen group is able to describe their subject to a lay audience. Then transcribe the lectures, edit them well so that they flow into a coherent story and offer them to the world at £8.95.

Impossible? On the contrary that is what John Mulvey has done with his editing of the transcripts of the 1980 Wolfson College Lectures. The result is probably the best up-to-date popular exposition of the recent exciting developments in this fundamental frontier of science.

During the past decade our perspective on Nature has developed radically. The disparate forces of gravity and electromagnetism and the short-range strong and weak nuclear forces are now thought to be part of a single unified theory that existed in the heat of the big bang. The sufficient context in which the lay, or even specialist, reader can evaluate the significance of the data. This situation is, perhaps, at its worst in the chapter on soils (J. A. Catt and A. H. Weir) which provides an excellent introduction to pedology but is completely isolated from the other chapters and even from the overall biological theme that is purported to unite both volumes. This chapter is also poorest in terms of the use of two-tone (blue and black) diagrams. The map of world soil types is essentially impossible to assess. The two-tone effect has otherwise been used to excellent effect.

Any biological theme seems to be largely absent. The palaeogeographical reconstructions (M. K. Horwath and C. G. Adams) are completely described in terms of land and sea distributions, yet biogeographical provinces are not shown and hardly mentioned, even in passing. As such, the book essentially does not form a companion volume with a biological interest. It does, however, provide a complementary philosophy and a quite good introduction to some Earth sciences.

There is little to challenge in the academic content as little is said that is new, and standard models tend to be followed for most evolutionary concepts. The exception to this is, of course, the chapter by H. G. Owen, predictably discussing the evidence for an expanding Earth. The editors, and some authors, are careful to provide caveats about their acceptance of Owen's models, yet none provide arguments against - except Owen himself. Certainly Owen's ideas should be included and, in fact, these provide virtually the only stimulation to a more specialist reader, but it is questionable whether such ideas should form almost the longest chapter in a book that is, in practice, designed for the lay reader.

Potential student readers would certainly get much better value from these *Physics of the Earth* (Freeman, 1978) and the lay reader is unlikely to be captured by this museum compilation. This is a pity for the change and challenge have been met in the conception and production, but the editors have left too much of the style to chance.

Frank Close

Frank Close is a principal scientific officer at the Rutherford Laboratory, Didcot.

The Investigation of the Physical World
by G. Toraldo di Francia
Cambridge University Press, £30.00 and £10.95
ISBN 0 521 23380 0 and 29925 X

This is a remarkable book. It is written in the style of a novel, in which the action is interlarded with moral comments. Here, however, the "action" is physics itself, presented sparingly, but with elegance and accuracy. The accompanying essays on the underlying philosophy concern themselves with the theory of observation, of logical inference, falsifiability of hypotheses, and other topics. When science and its philosophy are juxtaposed and expounded so ably, the result is refreshing and interesting.

workings of the proton have been studied. It is from these experiments, described by Don Perkins, that our new perspective has grown.

There is much to delight in this book, but one rather misleading statement appears: "Colour comes in three varieties compared to just two varieties (positive and negative) for electric charge". There is one type of charge and three types of colour. Just as electron and positron have "negative" and "positive" charge so do antiquark and quark have "negative" and "positive" colour. As SU(3) colour, SU(2) x U(1) weak-electromagnetism are central to much of the present outlook, and are important to get the three-two-one split out clearly, a minor hiccup in what is otherwise an excellent text.

There is much repetition among the several contributions, but each time said in a slightly different way with the result that a deeper understanding emerges than might be obtained from a single author. The logical exposition leaves the reader well prepared for Murray Gell-Mann's vision of the subject's future development. His chapter is an apt curtain down on an excellent collection.

Frank Close

Frank Close is a principal scientific officer at the Rutherford Laboratory, Didcot.

A physics refresher

The Investigation of the Physical World
by G. Toraldo di Francia
Cambridge University Press, £30.00 and £10.95
ISBN 0 521 23380 0 and 29925 X

This is a remarkable book. It is written in the style of a novel, in which the action is interlarded with moral comments. Here, however, the "action" is physics itself, presented sparingly, but with elegance and accuracy. The accompanying essays on the underlying philosophy concern themselves with the theory of observation, of logical inference, falsifiability of hypotheses, and other topics. When science and its philosophy are juxtaposed and expounded so ably, the result is refreshing and interesting.

The book is intended for the generally educated reader, to counteract the "gee-whizz" school of popular science. It assumes that the reasons for believing in the constructs of modern physics are at least as interesting as the constructs themselves, in the "gee-whizz" school, which seems to believe that the credulity of the physicists is to be accepted rather than explained, and the objects of belief to be wondered at. However, in spite of the simplicity and clarity of the writing, I cannot believe that the book will be easily read by anyone other than an educated scientist. The exposition consists largely of a discussion of theoretical concepts and simple mathematical equations, suitably named: Maxwell's equations, Snell's law, Hubble's constant, and so on. But so concise is this presentation, so concentrated the diet that a reader who has not encountered the ideas previously must suffer from acute indigestion.

The author early in his book refers rather dismissively to the "doubtful role of consensus in scientific theories". But as a working physicist one knows just how important is the reaction of one's colleagues: unless there is discussion, there is really no scientific progress. And if one reads the celebrated papers of twenty years ago or more, how strange and out of focus do the ideas seem: they are hardly the same as the crisply presented, neatly named laws which follow one another so inexorably in lectures.

So as Merton and Ziman have been telling us, the social environment is of great importance: it is indeed an important part of the job of the teacher of physics to try to initiate the student into the modes of thought and expression which will

make him an effective member of the society of physicists; and no mere recitation of the dogma will do this. What matters is the dialogue now. What also matters is the state of the art of experiment and observation, and of the thousand and one ways in which science is supported, aided, institutionalized and directed. Without some attempt to provide a glimpse of this context, the skeleton of ideas and equations is dry indeed, and the underlying philosophy no more than a ghost.

Yet this is a courageous, interesting and readable book. Far superior to run of the mill popular accounts of science, it deserves to be widely used: perhaps most effectively as enrichment material in a first-year university course in physics.

L. M. Brown

L. M. Brown is lecturer in physics at the University of Cambridge, and a fellow of Robinson College.

Efficient algorithms

Approximation Theory and Methods
by M. J. D. Powell
Cambridge University Press, £25.00 and £8.50
ISBN 0 521 22472 1 and 29514 9

Based on a course of 24 lectures to third-year mathematics students at Cambridge, this book ranges over most of the classical problems of univariate approximation and a selection of recent techniques. Special emphasis is placed on spline approximations because of their computational convenience and flexibility (in furnishing fairly smooth approximations without incurring the limitations of analytic functions), and because they give optimal mathematical solutions for certain problems of reconstructing functions from limited data. Multivariate approximation is not considered at all.

Although the underlying ideas of functional analysis are used, the formal apparatus required has been minimized, so that most scientists who encounter problems of approximation will find the book accessible. Again, technical matters of computer implementation are largely ignored, but much attention is paid to finding "efficient" algorithms, and many points of detail are discussed in this connection. The book is written from the angle of a theoretically inclined numerical analyst who is nevertheless concerned that all algorithms should be as practical as possible, rather than merely formally valid.

This attitude (aside from the more recent material he has included) distinguishes Powell's book from most other introductory works - for example, Cheney (1966), Lorentz (1966), Davis (1963) - and justifies another book in this area. Naturally, the spread of topics precludes comprehensive treatment, but superficiality is avoided by careful selection of the most fundamental results (all with proofs), well-chosen, non-routine exercises (though without solutions), and pertinent references. Throughout the book, classical methods are formulated, where appropriate, in modern terms, which allows a succinct presentation.

The style is lucid but informal. And the aesthetically attractive features of the subject are illustrated with many results of surprising economy and power. The book ends with an account of related work, and over 150 references. Presentation and typography are excellent.

J. S. N. Elvey

J. S. N. Elvey is a freelance mathematician working on a number of university-based research projects.

Bar J. Bok and Priscilla F. Bok's popular book on *The Milky Way* has been revised and edited to form a fifth edition, now published by Harvard University Press at £14. Now retired and in his mid-seventies, Bok "first became curious about the Milky Way as a Boy Scout in Holland at the age of twelve". Priscilla Bok died in 1975.

Oxford University Press

The Nature of Matter

Edited by J. H. Mulvey

The nature of matter presents a fundamental challenge to man in his attempt to understand the world of which he is a part. What is matter made of and how do the parts hold together? The discoveries made in search of answers to these questions have transformed the material basis and structure of society. This book includes the work of eight scientists involved in recent discoveries, and gives an over-all picture of the present state of this quest and the directions it might take in the future. Illustrated £8.95

The Natural Philosophy of Time

G. J. Whitrow

The object of this completely revised edition is to provide an up-to-date, comprehensive, and unified account of our knowledge concerning the concept of time and its role in the different sciences, particularly psychology, neurophysiology, biology, physics, and cosmology. The book is intended for scientists, philosophers, and all who take an interest in the subject of time and in the attempts that have been, and are being, made to understand this fundamental but puzzling concept. Second edition illustrated paperback £7.95

Cosmology

Michael Rowan-Robinson

This up-to-date introduction to modern cosmology is sufficiently systematic for use as a course text by physics or astronomy students and sufficiently self-contained for anyone with school science to understand. Second edition £12.50 paperback £5.95 Oxford Physics Series

Basic Quantum Mechanics

J. L. Martin

This new textbook is for a first full course in quantum mechanics and follows modern ideas on the presentation of the subject. The topics have been chosen as representative rather than exhaustive, since the clear description of basic ideas and methods is the foremost aim. £17.50 paperback £7.95 Oxford Physics Series

For more information about Oxford books on physics please write to Pene Naylor, Oxford University Press, Walton Street, Oxford OX2 6DP

'Only feminism is currently a major progressive force in western history'

Mary O'Brien argues that Marx, as a charter member of an exclusively masculine tradition of political thought, could not provide the theoretical grounds for true social reform. *Jessie Bernard writes 'Mary O'Brien's critique of de Beauvoir, Millett, Rowbotham, Reed, Arendt, strikes me as eminently fair and relevant... the books scholarship and erudition are impeccable.'* Patriarchal economic systems - socialist as well as capitalist - are founded upon women's unpaid labour. On this premise, Lisa Laghorn and Katherine Parker base their exploration of the economic basis of women's culture across cultures: from the USA to South America, the Middle East, socialist countries, Africa and Europe. *Adrienne Rich writes 'The term "economies" will never ring the same again... the truths about women and labour have been buried at least as deep as the truths of our sexuality.'*

The Politics of Reproduction

MARY O'BRIEN
0810 4 £11.95

Woman's Worth

Sexual Economics and the World of Women
LISA LAGHORN and KATHERINE PARKER
0836 8 £12 Paperback 0855 4 £5.95

ISBN Prefix: 0 7100

Routledge & Kegan Paul, 39 Store Street, London WC1

RKP

BOOKS

MATHEMATICS
AND PHYSICS

Newton's tracts

The Mathematical Papers of Isaac Newton, Volume VIII: 1697-1722 edited by D. T. Whiteside Cambridge University Press, £85.00 ISBN 0 521 20103 9

Famous already in the biography of Isaac Newton are his rapidly-found solution to Johann Bernoulli's brachistochrone problem of 1697, the "Tractatus de quadratura curvarum" in which at last he put a substantial presentation of his calculus into print in 1704, and his attempts around 1712 to rework Book 2, Proposition 10 of the *Principia* into a believable form for publication in the new edition of that work. All these episodes appear in great detail, including manuscript drafts and variants, in the lengthy first part of this final volume of Whiteside's edition of Newton's mathematical papers.

However, this volume reveals a more substantial coda to Newton's mathematical career than might have been expected, for it also contains material of less fame but no little content. Among manuscripts related to his publications, an interesting item is the "Analysis per quantitates fluentes", an amplification of the 1704 "Tractatus", intended for publication in the revised *Principia* but abandoned by Newton and published for the first time here. There are also some philosophical essays, which Whiteside well summarizes in his own subtitle to one: "the science of axiomatic deduction and the art of resolving problems". Mathematicians have often tried to relate their developing subject to the traditional distinctions of synthesis and analysis; there, Newton, like men both before and after him, had difficulty in associating these categories with geometry and algebra respectively.

The second, and final, part of this volume contains a sequence of manuscripts connected with the dispute of the 1710s and 1720s between Newtonians and Leibnizians as to which hero was the Onlie Begetter of the calculus. Apparently indifferent to the fact that even if Leibniz had known of Newton's fluxional calculus in the 1670s, he would have had to make major conceptual innovations in order to convert it into his own differential form, Newton devoted much of his eighth decade to insinuations against Leibniz's con-

duct and restatements of his own priority. The whole affair is tiresome, and has been worked over (too) many times by historians. Whiteside presents a selection of pertinent manuscripts and publications, prefaced by an account of the most relevant aspects of the dispute. The mathematical content of this volume closely follows that of its predecessors; but the personal context of these writings is significantly different, for, as Whiteside puts it, in 1696 Newton had "exchanged the quiet isolation of his Fenland university for the busy, commercial whirl of the metropolis" before writing the manuscripts presented here, when he was the Great Man of Science held in awe by his younger and aspirant contemporaries. The appropriate volumes of the edition of his *Correspondence* reveal the range of his concerns during his London years; this volume shows, in more detail than has previously been known, that he was still capable of sustained mathematical effort.

The first of these eight enormous volumes appeared in 1967, and succeeding ones came out with remarkable frequency during the following years. The interval between this volume and its predecessor has been much larger, for various reasons; but its eventual appearance impels on Whiteside's public the obvious but nevertheless pressing duty to salute the remarkable course of study, stretching back nearly a quarter of a century, to which he has devoted his career and through which he has made himself into a major scholar of our time. As a one-man effort, the project impresses in quantity and quality. As a printing performance, too, the staff of the Cambridge University Press deserves the accolade of the publishing industry.

Although this is the concluding volume of manuscripts, the edition is not yet complete. Whiteside chose an unusual form of editing (although Bowditch's nineteenth-century translation of Laplace's *Celestial Mechanics* bears some comparison): as well as providing a detailed edition of Newton's manuscripts, with much information on textual and documentary matters, he has also furnished lengthy accounts, in prefaces and footnotes, of many developments related to Newton's researches, thus making his edition also an important source for the history of mathematics in general. Thus, there is much information to retrieve from the eight volumes; but only analytical tables of contents (which themselves take some scanning) and indexes of names are available in each volume to the reader to enable him to retrieve that information. So it is a pleasure to see Whiteside announce in an "Editorial note" the preparation of a much needed ninth index volume. When this is available then the edition will be fully, and not just physically, available.

Ivor Grattan-Guinness

Ivor Grattan-Guinness is reader in mathematics at Middlesex Polytechnic.

and to water waves, which do not satisfy a wave equation of the usual type.

Up to this point in the book, all the waves satisfy linear equations. The next chapter contains a brief account of hyperbolic systems and the method of characteristics. This material is not applied to any non-linear problems, but the Cauchy initial value problem is discussed for linear waves in two and three dimensions. There is a final chapter containing a summary of results about certain functions used in the text. Examples are included at the end of each chapter.

The material is presented in a straightforward fashion and is usually easy to follow, although I was somewhat disappointed by the discussion of dispersion and group velocity. One or two of the diagrams are very roughly drawn and some are obscure. With the exception of the hydraulic jump all the examples are linear, which means that a number of the most interesting features of wave-motion are excluded, most notably the development of shocks. The production of discontinuous solutions from smooth initial data is a key topic in wave motion and without its inclusion the discussion of the hydraulic jump appears quite out of place. The limitation to linear problems prevents any discussion of kinematic waves and traffic flow.

A consequence of the authors' decision to present the material in a unified way is that descriptions of particular physical systems have to be rather sketchy. For example, electromagnetic waves are dealt with in only 11 pages of text. This is too little for a student who has not met Maxwell's equations before, but a student who has will almost certainly have learnt about electromagnetic waves in much more detail than is presented here.

This is, of course, just one aspect of the debate on the teaching of applied mathematics between those who would emphasize the physical system and those who are more interested in the mathematical methods used. This book on wave motion will attract the second group.

L. M. Hocking

L. M. Hocking is a professor of mathematics at University College, London.

Pearls of wisdom

100 Years of Mathematics by George Temple Duckworth, £32.00 ISBN 0 7156 1130 5

To the obvious question, whether there is still need or indeed possibility of a comprehensive treatment of any period of mathematics, Temple answers in several ways, each by itself convincing and together irrefutable.

First, this is not an attempt at a catalogue but rather a personal choice; to a large extent it is a choice of those parts of the subject to which he has made a contribution (surprising as this may seem to a reader who does not know him). Second, an allied point, the branches treated here have a common thread; they deal with number, its foundations and its generalizations. But, third, Temple detects in the more recent developments of the subject a tendency to end the continuing splitting and specialization in favour of a growing together of different branches. Not only does this make the present time appear for a magisterial account and it is hard to think of anyone else who would have the wide knowledge to do it - but it also means that young workers in the subject will have something to help them in the task which will confront them, of bringing together techniques and ideas from many different fields to solve problems thrown up by one.

It is said that 90 per cent of all mathematics has been produced in the past century, but it is not this fact so much as the date, 1879, the publication of Weierstrass's Berlin lectures on the arithmetical construction of the real number system, which suggested the period to Temple. From there the first part of the book leads on to infinitesimals and their rehabilitation, to Cantor's transfinite numbers and so, through the paradoxes, to the ideas of Frege and Peano. The second part is on space; here the starting point is algebra - Hamilton and Grassmann, then on to the various aspects of geometry beginning with Riemann and touching in turn on theories of distance (Cayley, von Staudt, Klein, Whitehead), systems of axioms (Klein, Hilbert, Hilbert, Lie), and the absolute differential calculus. This leads on in turn to modern algebraic geometry (Hilbert's basis theorem for invariants) and finally to something on topology, although here the emphasis is on the aspects of interest in analysis.

Although the author has made important contributions in that field, it is probably in that of the third part, analysis, that he will be longest remembered. Perhaps for this reason, perhaps because this field most needs a unifying treatment, this part is outstanding; beginning with the idea of functionality, it then goes on to theories of the integral with corresponding treatment of derivatives and so to distributions. This part concludes with applications of these ideas in ordinary differential equations, the calculus of variations and potential theory.



George Temple

The last part of the book deals with mathematical logic, beginning with Frege, then Russell, set theory, recursive arithmetic, Gödel incompleteness and Brouwer. The style is quite characteristic of the man; two examples will suffice. In talking of the paradoxes: "For Hilbert the Cantorian theory of transfinite numbers was a mathematical paradise, from which he refused to be expelled, but the paradise contains serpents and tempters with which we must now engage in combat." Or a more serious example: "Topology may be briefly, if unhelpfully, described as the study of those properties of general and abstract spaces which are invariant under continuous transformations, but it is more easily and significantly appreciated in its historical perspective as the confluence of three streams of mathematical thought arising from the theory of convergence initiated by Cantor, the theory of functional analysis developed from the calculus of variations by Volterra, and the theory of the connectivity of manifolds due to Riemann and Poincaré."

This book is sure to be treasured and read for many years; so it is worth pointing out two small errors which may be corrected in future editions. On page 257, it is misleading to call the intuitionist logic a "three-valued", since this term has a very definite sense applied to logics which the Brouwer logic does not conform. And on page 259, Brouwer proved that the five axioms for the propositional calculus in *Principia Mathematica* were not independent.

C. W. Kilmister

C. W. Kilmister is professor of mathematics at King's College, London.

BOOKS

MATHEMATICS
AND PHYSICS

Celestial X-rays

X-Ray Astronomy by J. Leonard Culhane and Peter W. Sanford Faber & Faber, £10.00 ISBN 0 571 11550 0

In its methods, its objects of study and its conclusions X-ray astronomy is surely one of the most flamboyant of the modern sciences. Its tools are borne aloft in rockets, balloons and artificial satellites, because X-rays, which may have travelled unhindered through a billion light years of space, cannot penetrate our atmosphere.

X-rays are an energetic form of electromagnetic radiation - each quantum carries 1000 times the energy of its cousin, the photon of visible light. To produce X-rays requires highly energetic electrons or matter at temperatures between one and a hundred million degrees Kelvin. Outside the laboratory such extreme conditions are found only in the most active and violent regions of the Universe. So in this book's survey of what has been learned through the study of celestial X-rays the chapter headings read like a catalogue of astronomical exotica: solar flares, supernovae, white dwarfs, neutron stars, black holes, quasars.

The book describes in sober detail the development of X-ray astronomy from its inception to about 1978. The field originated just after World War II when, in symbolic triumph of reason over chaos, captured V2 rockets lifted instruments to observe the Sun's corona. Discovery of the spectacular X-ray emitting stars and astronomical satellites of the 1970s brought a heady decade of growth in the variety of phenomena and the sophistication of theoretical understanding.

It is common for a book about such a rapidly moving field to be out of date at publication. Unfortunately, this one suffers more than usual because it all but ignores the explosion of results obtained since 1978 when an X-ray observatory with a thousandfold increase in sensitivity was launched into Earth orbit. The reader wishing to be up to date must supplement this work with magazine and journal articles.

Culhane and Sanford are active practitioners of X-ray astronomy who can write with assurance about their topic. They give a few (too few) glimpses behind the scenes into growing progress that constitutes scientific research. They can both articulate a neat explanation and unambiguously raise the challenge of an unanswered question. However, despite an appearance of objectivity and completeness, the authors show a decidedly personal and chauvinistic bias in their selection of examples and particularly in their overemphasis on British achievements.

A major drawback of this book is that it is aimed at too many levels and will likely satisfy no one fully. Admirably, the authors include details of number and quantity. The many graphs, diagrams and occasional light literature are culled from the original. However, the explanations and definitions cover the range from basic to cryptic. A profusion of gratuitous facts clutters each section, and while some dates are useful the frequent listing of personal names associated with certain discoveries serves no purpose outside the one seen in the glaring omissions and the inadequate index (there is no reader who will offer little rescue for the glossary who feels adrift).

Nevertheless, this book fills a section needed for an introductory text that one can recommend to undergraduates or to scientists in other disciplines or to interested and informed laymen who are able to cope with the expository shortcomings. In their closing chapter on the future of the field, the authors lower their gaze from the heavens to view the realities of contemporary research. Although even a modest extrapolation of the activity of the past three decades would have predicted for the 1980s a period of scientific maturity and achievement equal to that of any other major discipline, the current fiscal austerity has severely stifled X-ray astronomy's relatively expensive pursuits.

Claude R. Cantzares

Claude R. Cantzares is associate professor of physics at the Massachusetts Institute of Technology.

Oscillatory behaviour

An Introduction to Nonlinear Oscillations by R. E. Mickens Cambridge University Press, £30.00 ISBN 0 521 22308 9

Many physical situations in which oscillatory behaviour occurs, for example, swinging pendulums and certain nonlinear electrical circuits, can be described by nonlinear second-order differential equations. Such equations have been much studied by mathematicians, the book under review being the latest in a long line of books on nonlinear oscillations.

Most of the equations of interest cannot be solved explicitly. Pure and applied mathematicians have used different approaches in the face of this difficulty. Pure mathematicians have proved theorems on the existence and multiplicity of solutions and have provided conceptual frameworks, for example, the theory of dynamical systems, convenient for the study of the qualitative behaviour of solutions. Applied mathematicians have developed methods for obtaining formulae which give approximations to the solutions of the equations. These methods give more detailed information about particular equations than do the more abstract approaches and can usually be given a rigorous justification. The results obtained, however, are often valid for a very limited range of parameter values and practitioners of the art must guard against becoming "formula-crazy", using standard methods to produce increasingly complicated formulae without regard to their validity.

Professor Mickens's book gives a full and clear exposition of some of the most popular methods used by applied mathematicians for producing approximate solutions. The first chapter discusses physical examples of nonlinear oscillations and describes how equations may be expressed in dimensionless form. Subsequent chapters deal with the Lindstedt-Poincaré perturbation technique, methods of slowly varying amplitude and phase developed by Krylov, Bogoliubov and Mitropolsky, multi-time expansion methods and, finally, iteration and perturbation techniques useful for equations describing forced oscillations. Heuristic justifications are given for most of the methods described, the reader being referred elsewhere if he desires more rigour. The book ends with several appendices dealing with background material such as Fourier series, asymptotic expansions, existence and uniqueness theorems for differential equations and properties of limit cycles.

Despite its price the book is aimed at an undergraduate audience. It should prove very useful to anyone wishing to learn how to use the methods described; a noteworthy feature is the way in which each method is applied to several different examples; further examples are given as exercises at the ends of chapters. The book does not in itself, however, give a full picture of the study of nonlinear differential equations; it is light on rigour and, more seriously, gives little indication of what can be achieved by geometric means. There is no systematic account of the use of the phase plane and no mention of the Poincaré-Bendixson theorem.

In conclusion, the book does very well what it sets out to do but does not tell the whole story.

Kenneth Brown

Kenneth Brown is lecturer in mathematics at Heriot-Watt University.

Boundary conditions

An Introduction to Numerical Methods for Differential Equations by James M. Ortega and William G. Poon, Jr Pitman, £8.95 ISBN 0 273 01637 7

The numerical solution of ordinary and partial differential equations is a particularly important branch of numerical analysis. Many scientific and engineering problems involve the solution of one or more differential equations, and it is usually impossible to solve these equations analytically.

While a variety of numerical techniques are available for solving differential equations, care has to be exercised in each specific instance to find the most suitable method, as some may give rise to unacceptable numerical error in the solution, while others may involve prohibitive amounts of computation. With all the methods the numerical values of the boundary conditions must be given in advance, and the solution to a specific problem is determined. By solving several equations with different boundary conditions it may be possible to obtain an idea of the general solution, although care is needed in the interpretation of the results.

Some mathematics, science and engineering undergraduates will regard numerical analysis as a small part of their curriculum, and will content themselves with a general text. More serious students will also look for a book dealing specifically with the numerical solution of differential equations: this book may well meet their requirements.

particular equations than do the more abstract approaches and can usually be given a rigorous justification. The results obtained, however, are often valid for a very limited range of parameter values and practitioners of the art must guard against becoming "formula-crazy", using standard methods to produce increasingly complicated formulae without regard to their validity.

Professor Mickens's book gives a full and clear exposition of some of the most popular methods used by applied mathematicians for producing approximate solutions. The first chapter discusses physical examples of nonlinear oscillations and describes how equations may be expressed in dimensionless form. Subsequent chapters deal with the Lindstedt-Poincaré perturbation technique, methods of slowly varying amplitude and phase developed by Krylov, Bogoliubov and Mitropolsky, multi-time expansion methods and, finally, iteration and perturbation techniques useful for equations describing forced oscillations. Heuristic justifications are given for most of the methods described, the reader being referred elsewhere if he desires more rigour. The book ends with several appendices dealing with background material such as Fourier series, asymptotic expansions, existence and uniqueness theorems for differential equations and properties of limit cycles.

Despite its price the book is aimed at an undergraduate audience. It should prove very useful to anyone wishing to learn how to use the methods described; a noteworthy feature is the way in which each method is applied to several different examples; further examples are given as exercises at the ends of chapters. The book does not in itself, however, give a full picture of the study of nonlinear differential equations; it is light on rigour and, more seriously, gives little indication of what can be achieved by geometric means. There is no systematic account of the use of the phase plane and no mention of the Poincaré-Bendixson theorem.

In conclusion, the book does very well what it sets out to do but does not tell the whole story.

Kenneth Brown

Kenneth Brown is lecturer in mathematics at Heriot-Watt University.

A selection of recent and forthcoming books reflecting the continuing development of our list in the mathematical and physical sciences and science-based technology

Adam Hilger

The Camera Obscura

John H Hammond
The fascinating history of the original 'camera', an optical viewing device once widely used by artists and astronomers, travellers and showmen. Extensively illustrated.
1981 182pp 0-85274-451-X £13.50

Colour Vision in the Nineteenth Century

The Young - Helmholtz - Maxwell Theory
Paul D Sherman
The intriguing story of the chequered progress towards a fundamental understanding of colour perception, colour mixing and colour blindness.
1981 233pp 0-85274-376-9 £35.00

A European Experiment

The Launching of the JET Project
Dennis Willson
Foreword by Sir Monty Finniston
A revealing account of how national and supranational politics affected the building of a major fusion energy experiment within the European Community.
1981 178pp
hardcover 0-85274-543-5 £10.50
flexicover 0-85274-549-4 £8.95

Parallel Computers

Architecture, Programming and Algorithms
R W Hockney & C R Jesshope
A practical and comprehensive introduction to the architecture and associated software of operating supercomputers, combining an advanced text for students with a reference for professional users.
1981 416pp 0-85274-422-8 £22.60

Gauge Theories in Particle Physics

I J R Aitchison & A J G Hey
A new, intuitive approach to the ideas and methods of gauge field theories in elementary particle physics, presenting this advanced theoretical topic at a level which is accessible to experimental physicists and new graduate students.
January 1982 332pp flexicover 0-85274-534-6 £14.50

Instrument Science and Technology

Volume 1
Edited by B E Jones
The first volume of a series on measurement and instrumentation, reflecting the need for a better understanding of the general principles and concepts of the subject.
January 1982 approx 120pp 0-85274-438-2 £6.95

Applied Thermoluminescence Dosimetry

Edited by M Oberhofer & A Schramm
A comprehensive survey derived from an ISPRC course, and intended to become the new standard reference on the subject.
1981 396pp 0-85274-544-3 £35.00

Heat Pumps

J T McMullan & R Morgan
A complete introduction to the design, testing and operation of heat pumps, drawing on the authors' considerable experience in waste heat recovery.
1981 168pp 0-85274-419-6 £15.00

The Isotropic Universe

D J Raine
An intermediate-level introduction to contemporary ideas in cosmology, with a novel emphasis on physical cosmology rather than the usual 'expanding universe' approach.
1981 266pp 0-85274-370-X £19.50

Public Science - Private View

D W Budworth
A critical inside view of British science policy, reflecting the author's privileged observations of how it is made and his personal experiences of how it works.
1981 183pp
hardcover 0-85274-449-8 £9.95
flexicover 0-85274-462-8 £5.95

Adam Hilger Ltd, Techno House, Redcliffe Way, Bristol BS1 6NX, England

The Adam Hilger book-publishing imprint is owned by The Institute of Physics

FORTAN 77

Donald M. Monro
This highly-structured text provides an introduction to the most recent standard version of the language, FORTRAN 77.
£8.50 approx paper 368 pages January

PASCAL for Students

R. Kamp
An introductory text for students learning Pascal as their first language and also those already familiar with other languages.
£5.95 paper 232 pages January

Basic Statistical Computing

D. Cooke, A. H. Craven and G. M. Clarke
A text discussing the ways in which a microcomputer may be used to understand and carry out statistical analysis. Algorithms are listed for standard statistical procedures.
£6.95 approx paper 168 pages approx February

Calculus: Pure and Applied

A. J. Sherlock, E. M. Roebuck and M. G. Godfrey
An up-to-date introductory text developing the ideas of calculus logically, explaining the principles and demonstrating them to be physically plausible.
£7.50 non-net approx paper 644 pages February

Ordinary Differential Equations

Theory and Applications
M. Rana Mohana Rao
A basic text with the emphasis on the interaction between theoretical and practical aspects which helps to identify the use of ordinary differential equations in a variety of problems in engineering and science.
£8.50 paper 280 pages November

Edward Arnold
41 Bedford Square, London WC1B 3DQ

Wave motion

The Mathematical Theory of Wave Motion
by G. R. Baldoek and T. Bridgeman Ellis Horwood: Wiley, £19.50 and £6.90 ISBN 0 85312 225 3 and 291 1

Waves occur in a large variety of physical systems. The authors' aim in this book is to describe their common features mathematically and to explain the techniques available for problem-solving.

The book begins with one-dimensional waves, such as occur on stretched strings, and discusses the Fourier method of solution, dispersion, and discrete systems. The topics then widen to cover two-dimensional waves - on membranes and three-dimensional acoustic, including diffraction and scattering. Further extensions are made to electromagnetic waves, which need a vector function to describe them,



MODERN PHYSICS:
The Quantum Physics of Atoms, Solids, and Nuclei, 3rd Ed.
by L. Sproull, University of Rochester,
and W.A. Phillips, University of Cambridge

An analytical study of the quantum physics of atoms, molecules, solids, and nuclei is presented in this textbook. The aim has been to cultivate a middle ground, in which a quantitative understanding of atomic, molecular, solid-state, and nuclear physics is attained through the application of elementary quantum mechanics.

0471 818402 696pp November '80 \$43.25/£24.05
0471 079936 696pp November '80 WIE \$21.95/£11.75

THE MATHEMATICAL THEORY OF WAVE MOTION
by G.R. Baldock and T. Bridgeman, Department of Applied Mathematics and Theoretical Physics, University of Liverpool

A comprehensive study of wave motion expressed in the clear mathematical language so essential for a sound appreciation of all aspects of wave phenomena in their many physical manifestations.

Ellis Horwood Series in Mathematics and Its Applications. Editor: G.M. Bell

085312 2253 262pp March '81 (cloth) \$42.60/£19.50
085312 2911 262pp July '81 (paper) \$17.45/£6.90

ASTRONOMY: A Self-Teaching Guide, 2nd Ed.
by D.L. Moche, Queensborough Community College of the City University of New York

An individualized, self-instructional guide introducing astronomy in clear, simple language. It covers the main areas of astronomy, basic principles and concepts, and current fields of research. *Wiley Self-Teaching Guide*

0471 09713 6 282pp December '81 \$10.50/£5.30

MODELLING WITH DIFFERENTIAL EQUATIONS
by D.N. Burgess, Department of Mathematics, Cranfield Institute of Technology, and M.S. Borrie, Pilgrim School, Bedford

Explains the theory of ordinary differentials and introduces their manifold applications in such instances as accident risk or fish population; forgery detection in old masters or kidney life-support machines; and many others.

Ellis Horwood Series, Mathematics and Its Applications. Editor: G.M. Bell

085312 2865 172pp April '81 (cloth) \$27.35/£12.50
085312 2962 172pp June '81 (paper) \$12.40/£4.90

Published by Ellis Horwood Ltd., Chichester.

Please write to the Textbook Manager if you need books for course use. Inspection copies of certain titles are available.

John Wiley & Sons Limited
Baffins Lane, Chichester, Sussex PO19 1UD, England

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Turtle Geometry

The Computer as a Medium for Exploring Mathematics
by Harold Abelson and Andrea diSessa

Turtle Geometry is an innovative program of mathematical discovery that demonstrates how the effective use of a personal computer can profoundly change the nature of a student's contact with mathematics. It proceeds from a novel 'procedural' view of the elements of plane geometry to such central ideas in modern mathematics as symmetry groups and topological invariance. From the beginning, geometric figures are regarded not as static entities but as beings of an imaginary 'turtle', a view which culminates in a treatment of the ultimate synthesis of geometry and motion, Einstein's General Theory of Relativity.

The not-so-imaginary turtle that brings this book to life is a glowing tracer whose habitat is the display screen of a small computer system: it moves at a deliberate pace which keeps the process of learning and discovery always under the student's control.

Published September, 416 pages, £14.00, 0 282 01063 1.

Philosophy of Mathematics and Deductive Structure in Euclid's 'Elements'
by Ian Mueller

This is the most intensive examination of Euclid's *Elements* in English since the last revision of T. Heath's monumental translation and commentary appeared over 60 years ago. While the present work segments and updates Heath's in the light of subsequent scholarship, its principal concern is to apply the resources of modern logic and philosophy of mathematics to the *Elements* in order to provide an understanding of the distinctive Greek conception of the foundations of mathematics. Published November, 400 pages, 200 illus, £26.25, 0 282 13183 3

128 Buckingham Palace Road, London SW1W 9SD.

THE MIT PRESS

MATHEMATICAL SCIENCES AUTUMN 1981

Applied Statistics

Principles and examples
DR COX P.R. and SJ ENELL
September 1981, 190 pp
Hb 0 412 16860 0 £13.50
Pb 0 412 16870 8 £8.95

Functions of Several Variables

B D CRAVEN
December 1981, 144 pp
Hb 0 412 26380 4 £10.00
Pb 0 412 26390 1 £4.95

Full details of all our mathematical reference titles are available from:

CHAPMAN & HALL
11 New Fetter Lane, London EC4P 4EE and 733 Third Avenue, New York, NY 10017

Intermediate Statistical Methods

G BARRIE WETHERILL
June 1981, 380 pp
Hb 0 412 16440 X £18.80
Pb 0 412 16480 7 £8.75

Solutions to Exercises in Intermediate Statistical Methods

G BARRIE WETHERILL
June 1981, 74 pp
Pb 0 412 83980 X £3.00

Graphs, Surfaces and Homology

An introduction to algebraic topology
Second Edition
P J GIBLIN
Chapman & Hall Mathematics Series
October 1981, 330 pp
Pb 0 412 23900 0 £8.95

Sets, Functions and Logic

Basic concepts of university mathematics
K J DEVLIN
May 1981, 90 pp
Hb 0 412 23860 X £8.50
Pb 0 412 23870 7 £2.95

Norman Dombey

Norman Dombey is reader in theoretical physics at the University of Sussex.

BOOKS

MATHEMATICS AND PHYSICS

Into the rainbow

Rainbows, Halos, and Glories
by Robert Greenler
Cambridge University Press, £15.00
ISBN 0 521-23605 3

Atmospheric optics has generally been regarded as a fragmentary area of science, peripheral to many others, such as cloud physics, glaciology and atmospheric radiation, but insufficiently well integrated and understood to warrant its establishment in its own right as an important subject. This may have been due, in part, to the fact that there are no significant practical applications of phenomena such as rainbows, halos and glories.

I suspect that there has been a tendency to assume that a study of these aesthetically appealing phenomena will reveal no new physical insights into the natural world - that although the mathematical details may not have been fully worked out the physics is obvious and thus unworthy of attention. In fact, as Greenler demonstrates most convincingly in this attractive and authoritative book, there exist many quite fundamental misconceptions concerning atmospheric optical phenomena, which have been perpetuated up to the present, and are found in many otherwise unexceptionable works.

Greenler sets himself the task of synthesizing and classifying the multitude of such phenomena, and providing a clear and precise explanation of each one. He has succeeded fully in this task. This must be due, to a significant extent, to the fact that he has performed a considerable amount of original research on these topics, particularly computer simulations of optical effects involving ice crystals.

The book begins with a lengthy chapter on the rainbow. Descartes' theory is clearly presented and is seen to account satisfactorily for the major features. This leads to discussions of the size and colour of the rainbow (Newton's optical studies were crucial here), higher order rainbows, and various exotic types of this phenomenon such as white and lunar rainbows.

The kernel of the book is the three chapters on optical effects associated with the refraction and reflection of sunlight by ice crystals. These ice particles, which grow in the atmosphere by the diffusion of water vapour, assume a variety of (basically hexagonal) shapes, according to the temperatures and supersaturation of their environment; and their orientation is a function of their shape and size. Thus a host of refraction phenomena exist.

Greenler and his colleagues at the University of Wisconsin have performed novel and detailed computational studies of these effects, which are seen, as the chapters unfold, to provide full quantitative explanations. Having established that his computer simulations can reproduce accurately these individual phenomena Greenler applies them to spectacular optical displays in which many of the processes occur simultaneously. He is then able successfully to provide explanations for notable displays observed in the past.

A chapter concerned with the scattering of light provides clear explanations for the colour of the sky (day and night), white, black and coloured clouds, air-light, crepuscular and anticrepuscular rays, the twilight wedge, the moon's shadow on the Earth's atmosphere, and the ice-blink and water-sky. The chapter on diffraction deals with the corona, cloud iridescence, Bishop's ring, the spectre of the Brocken, the glory, and the heiligenschein (dew, dry and streak).

The final chapter, on atmospheric refraction, provides authoritative treatments of the flattened sun, the desert (inferior) mirage, mirages across warm water and frozen lakes,

superior mirages, the Arctic mirage, the twinkling of stars, the green flash and distortion of the setting sun, the red flash, and the beautiful and mysterious Fata Morgana, the general name for multiple mirages. According to Humphreys, 'Morgana (Breton equivalent of sea woman) ... exhibited her powers by the mirage. Italian poets represent her as dwelling in a crystal palace beneath the waves. Hence, presumably, the name Fata Morgana (Italian for Morgan le Fay, or Morgan the fairy) was given, centuries ago, to those complicated mirages that occasionally appear over the strait of Messina ... molding the bluffs and houses on the opposite shore into wondrous castles that, alike, tower into the sky and sink beneath the surface.'

The book contains many magnificent photographs, together with informative sketches and useful example questions. Elegantly written, it is the first definitive book in this attractive area of science.

John Latham

John Latham is professor of atmospheric physics at the University of Manchester, Institute of Science and Technology.

Physical concepts fudged

Modern Physics for Applied Science
by Barry C. Robertson
Wiley, £13.40
ISBN 0 471 05343 0

Modern physics is defined in this new textbook as covering any physical property that classical physics (Newton's laws) cannot explain adequately and any development that has occurred in the past fifty years that is based on physical principles.

So in the first category we have chapter one on special relativity, chapters three to five on quantum mechanics applied to atoms and molecules, chapters seven and eight on band theory, semiconductors and devices, and chapters nine and ten on the nucleus and 'practical nuclear energy'. However, there is relatively little in category two which is not in category one: there is one section of one chapter on the electron microscope and similarly one section on acoustic holography. Basically this book provides another quick run through relatively elementary quantum mechanics, lasers, semiconductors and nuclear fission.

The restricted nature of the author's grasp of physical concepts is apparent from the first sentence. For classical physics is much more than Newton's Laws: electromagnetic theory, hydrodynamics and thermodynamics, for example, are just as classical as Newtonian mechanics. When such classical quantities appear in the subject matter there is no

attempt to explain or remind the reader what physical principles are involved; a formula simply appears out of the blue. Thus thermodynamic principles involving temperature are never discussed; temperature does not appear in the index to the book and appears first in chapter two as an unexplained parameter in such star sentences as 'The proper description of energy distribution of a gas is given by the Maxwell-Boltzmann distribution ... This distribution peaks at $\frac{1}{2}kT$ and has the general shape shown in Fig. 2.3.' Similarly in the same chapter the student is introduced to the electromagnetic nature of light by 'Light is a transverse oscillating electric and magnetic field, and it can give kinetic energy to electrons'; there is no mention of Maxwell's equations or even of an electromagnetic wave.

This resistance to physical concepts and explanation as a means of communicating ideas increases when quantum mechanics is introduced. Planck's constant is introduced solely as the proportionality between photon energy and frequency in the photoelectric effect; there is no mention of the Planck radiation law, thus again avoiding dealing with temperature. There is a section on waves when 'deriving' Schrodinger's equation but it will be incomprehensible to anyone who does not know the subject in the first place: the time-coordinate invariance vanishes from the wave equation; the uncertainty principle is introduced as an energy-time relationship; and the diffraction pattern of a wave passing through a narrow slit is depicted as a circular arc (Fig. 4.1).

It should be possible to make quantum mechanics and other subjects intelligible to the non-specialist. But a subject as complex as coherence cannot be treated by simply referring to the two words 'in phase' (especially where phase is nowhere discussed in the earlier sections on optics) nor are phrases like 'an avalanche of incoherent photons' useful for understanding what is happening. There are many other good introductory books on modern physics, however they may be defined. Wiley could have brought Over's *Fundamental Physics* up to date, as this would provide an excellent textbook for the non-specialist.

It is certainly important for students to realize the practical applications of physical concepts and it is also true that a satisfactory description of a particular device does not need to wait for complete comprehension of those concepts. Nevertheless, there can be no good reason to confront any student (of physics or of applied science) with woolly and ill-founded arguments of the type presented here.

NOTICE BOARD

Appointments



Mr Roderick Brydon, principal conductor and artistic director of the Scottish Chamber Orchestra who is joining Heriot Watt's acoustics research team as a senior research fellow on a part time basis. The team is pursuing a £75,000 study of the acoustic design of auditoria for the performance of opera and other music theatres and in particular of the relationship between the design of partially enclosed orchestra and the performance of musicians.

General

Sir Henry Chilver, vice-chancellor of the Cranfield Institute of Technology, is to be the first president of the CPD in Construction Group. The group represents the collective efforts of the construction professions for continuing professional development.

Professor Olive Stevenson of Keele University is to join the Central Council for Education and Training in Social Work as the representative of the Social Work Education Committee. The committee as part of the Joint University Council for Social and Public Administration represent the majority of the country's department of social work education in universities, polytechnics and colleges.

Professor Keith Begg, head of the regional medical physics department and head of the medical physics department of the Institute of Physics, is to be elected to the Royal Society of Medicine Council until July 31 1982. He replaces Professor Sir James Baddiey who has resigned.

Chairs

The following have been awarded the title of Professor of the University of London:

Dr Kenneth A. Kernack, vertebrate paleontology, University College.

Dr Fred F. Land, systems analysis, London School of Economics.

Dr Andre Ernest M. McLenn, zoology, University College, London.

Dr Herwig Gustav Theodor Maehler, payrology, University College, London.

Dr Roger Berry, public health and water technology, Imperial College.

Dr Louis Joseph Rydell, naval architecture, University College, London.

Dr Richard Ruston (Kharasid) Saraf, ancient philosophy, King's College, London.

Dr Nelson Vigne Smith, linguistics, University College, London.

Dr Brian Charles H. Steel, materials science, Imperial College.

(£4.95 at the moment or £40 for the whole series if bought before December 31) from the SRIE at the University of Surrey.

Recent publications

Higher Education and the Labour Market, edited by Robert Lindley, the first in a series of books for research into Higher Education, contains the findings of the Laverham programme of study into the future of higher education. It is now available. Other monographs will cover demand and supply, institutional adaptation and change, the research function, the teaching function and the continuing development, the arts, financial mechanisms and structure and governance.

The DOG guides - *Directory of Opportunities for Graduates* - have been revamped into a new format aimed at harassed students who have neither the time nor the inclination for heavy reading when it comes to careers literature. The guides cover careers in accountancy, finance, computing and engineering and give up to the minute information about current jobs and employment issues. (Available from VNU Business Publications BV, 53/55 Fifth Street, London W1, £1.50 each.)

Grants

Universities

Hull

Engineering Design and Manufacture - Professor W. D. Morris - £51,523 from the SERC for investigation on the effect of rotation on the transfer of heat.

Physics - Dr B. C. Cavenett - £30,119 from the SERC for an investigation on identification of deep traps in semiconductors.

Leeds

Geography - £128,879 N from the SERC for a study of Urban Systems - Models for planning and policy under Professor Wilson.

Food Policy and Administration - £49,515 from Dr P. B. Hughes and Dr D. W. Pickard, Cornelia - £26,616 from the SERC and Chlorine - £26,616 from the SERC for an investigation of the effects of chlorine on the metabolism of the rat.

Animal Physiology and Nutrition - £42,491 from the Wellcome Trust for a study of phosphate homeostasis in ruminants and its relationship to the control of vitamin D metabolism under Professor Carr.

£23,315 from Agricultural Cooperation and Marketing Services Ltd for an investigation of the effects of feeding on the productivity of the dairy cow.

Food Science - £16,600 from the SERC for the computer simulation of particle dynamics in stable and unstable convectioned dispersion under Dr E. Dickinson.

£45,351 from the Ministry of Agriculture, Fisheries and Food for an investigation of vegetable and fruit peroxidases - susceptibility to heat of purified peroxidases under Professor Robinson.

Fuel and Energy - £38,480 from the SERC for a study of impingement cooling of gas turbine combustion walls: full coverage heat transfer investigations under Dr G. E. Andrews.

Mechanical Engineering - £14,437 from the SERC for a study of divided chamber combustion in a spark-ignition engine under Dr C. G. W. Sheppard.

Open University programmes November 14 to 20

Saturday November 14

10.30P Governing Schools. The Meeting (1970; prog 1).

11.00 Science foundation course: S101 Preparatory Maths - Algebra (S101; prog MAFS2).

Radio 4 (VHF)

8.30 Into the Open 3. Learning from Television and Radio.

7.15P The Open 3. Choices. Striving Up (1991; prog 2).

7.25P The First Years of Life. Down in the Dumps (1911; prog 2).

Sunday November 15

11.20P The Pre-School Child. Naughty Things (1912; prog 2).

11.40P Into the Open 3. Learning from Television and Radio.

11.40P The First Years of Life. All Young (1911; prog 2).

Thursday November 19

8.00P The First Years of Life. All Young (1911; prog 2).

Forthcoming Events

'Irish Names: Families, Dynasties and Places' by Professor Donnchadh O. Corrain of the Cork, a public lecture arranged by the Institute of Irish Studies and the Ulster Place Name Society is to be delivered on November 26 at 8 pm in Room 15 of the Social Sciences Building of the Queen's University, Belfast. Admission free.

'The General Household Survey as a Teaching Aid', a seminar organized by the SERC Survey Department of Essex, Wivenhoe Park, Colchester, Essex CO4 3SQ, is to be held on November 26. 'The British Election Study', a seminar organized by the SERC Survey Department, is to be held on November 27. Further information from the above address.

'The Use of the Mother Tongue alongside English in the Education of Ethnic Minority Workers particularly at basic level', a seminar organized by the Adult Literacy and Basic Skills Unit is to be held on November 19 at the University of London Institute of Education, 20 Bedford Way, London WC1. Details from the SERC (N.W. Consortium for Marine Technology Grant) - for a study of wave loading on small diameter cylinders.

'Minority Language in Central Scotland', a one-day conference organized by Glasgow University's department of adult and continuing education in conjunction with the Association for Scottish Literary Studies is to be held on November 21 in the department of geology, Llytham Gardens, Fee: £2.50. Details from the department of adult and continuing education, 57/61 Oakfield Avenue, Glasgow G12.



Pilot A. V. Roe, the first Briton to fly a British built machine, looks bemused after crashing his triplane at Wembley Park in December 1909. A full size replica of this and other planes with a brief introduction can be seen at a special exhibition 'London's Flying Start' being held as a tribute to the young men who pioneered Britain's aircraft industry in Edwardian London at the Museum of London until May 9.

Transport Studies - £17,200 from the Department of Transport for a study of the transport aspects of transportation models under Mr H. R. Kirby.

£13,954 from the Ross-Jeffrey Road Fund over two years for the monitoring of urban congestion under Professor May.

£22,485 from the SERC for the monitoring of urban congestion under Professor May.

£22,485 from the SERC for the monitoring of urban congestion under Professor May.

For an investigation of flow cytometry of human and animal tumours under Professor Joslin/Dr B. Dixon.

Cancer Research - £16,068 from the Yorkshire Cancer Research Campaign for electron microscopy of human bladder cancer under Professor Cooper.

£67,688 from the Yorkshire Cancer Research Campaign for a study of quantitative and qualitative changes in glycylated plasma proteins in monitoring cancer in man under Professor Cooper.

Oral Biology - £16,673 from the MRC for an investigation of the role of the oral cavity in enamel exposed to moist acid vapour under Professor Weatherell and Dr C. Robinson.

Salford

Applied Acoustics - Dr A. D. Suckes and Dr B. W. Jones - £67,714 from the SERC for research on the effect of moisture on the thermal response of walls under cyclic environmental conditions.

Acoustics & Mechanical Engineering - Professor T. R. Crossley - £60,500 from the SERC for research on design for robot assembly.

Mr D. Teer and Dr R. D. Arnold - £36,600 from the SERC for a project on two component coatings.

Biology - Dr P. M. Hyde - £28,891 from the SERC for a project on the resistance of wheat to the cereal yellow rust under Dr C. Fairhurst.

£14,000 from the Merseydale County Council - for a continuing project on Dutch Elm Disease control.

Biomechanics - Professor R. B. Cantall and Dr J. T. Richards - £24,594 from the MRC for an investigation of the mechanical properties of normal and malignant human lymphatic cells with monoclonal antibodies under Professor Bird.

Civil Engineering - £37,747 from the SERC, for an investigation of microbial interactions in European waste stabilisation ponds and their influence on engineering design under Professor Mars.

Food Science - £16,600 from the SERC for the computer simulation of particle dynamics in stable and unstable convectioned dispersion under Dr E. Dickinson.

£45,351 from the Ministry of Agriculture, Fisheries and Food for an investigation of vegetable and fruit peroxidases - susceptibility to heat of purified peroxidases under Professor Robinson.

Fuel and Energy - £38,480 from the SERC for a study of impingement cooling of gas turbine combustion walls: full coverage heat transfer investigations under Dr G. E. Andrews.

Mechanical Engineering - £14,437 from the SERC for a study of divided chamber combustion in a spark-ignition engine under Dr C. G. W. Sheppard.

Friday November 20

11.20P The Pre-School Child. Naughty Things (1912; prog 2).

11.40P Into the Open 3. Learning from Television and Radio.

11.40P The First Years of Life. All Young (1911; prog 2).

nonlinear control systems. Dr A. E. Hill and Dr J. S. Colligan - £17,369 from the SERC for an investigation of shallow implanted layers formed by simultaneous low bombardment and sputtered atom deposition.

Pure and Applied Physics - Dr A. D. Boardman - £46,754 from the SERC for a study of the properties of optical fibres and their applications.

Politics and Contemporary History - £10,615 from the SERC - for a project entitled Research Co-ordinator for SERC Executive Panel on Central-Local Government Relations, to be carried out under Mr M. Goldsmith.

Sussex

Astronomy - £166,600 from the SERC for research in theoretical astronomy, under the direction of Professor L. Mettel and Professor R. J. Taylor.

Chemistry - £35,600 from the SERC for work on sterically hindered organometallic compounds, under the direction of Professor C. Ebdon.

Engineering - £20,000 from the Wolfson Foundation for research on electromagnetic bearings for machine tool applications, under the direction of Professor B. V. Jayawant and Dr R. Holmes.

Experimental Physics - £51,623 from the SERC for 60 kV beam facility, under the direction of Dr P. D. Townsend.

Dr M. W. Lee and Mr W. Farnery - £184,550 from the SERC for experiments at millidegree and submillidegree temperatures, under the direction of Professor D. F. Brewer and Dr D. S. Betts.

OSC 'X' - Genetics

Health Service - £44,000 from the Nuffield Provincial Hospitals Trust for an investigation of factors affecting the difference of innovations in the National Health Service, awarded to the Centre for Medical Research.

Polytechnics

Hatfield

School of Engineering - £37,000 from SERC to support Dr J. M. Illston's work on the durability of concrete. £126,000 from SERC to support a Teaching Company scheme based on metal industries. £29,500 from the Leverhulme Trust to support a Research Fellow in MBE techniques and application.

School of Information Sciences - £70,000 from SERC to support Dr Q. Bull and Dr M. Kornblin in work on design of user interfaces in interactive computer systems.

School of Natural Sciences - £29,000 from Ministry of Defence to support Dr R. N. Smith's work on identification and evaluation of potential biohazards. £29,000 from Ministry of Defence to support Dr J. L. Hildrew and Dr P. Kaya's work on particle analysis by light scattering.

National Reprographic Centre - £187,000 from British Library to continue support of Centre in microform and word processing activities.

Correction

Awards made to Dr J. R. Short and Dr P. T. Smith under geography and psychology respectively by the SERC should have been listed under Reading University, not the Policy Studies Institute as stated in *The Times* on October 23.

Classified Advertisements

To place your advertisements write to:

The Advertisement Manager,
The Times Higher Education
Supplement, P.O. Box 7, New
Printing House Square, Gray's
Inn Road, London WC1X 8EZ.
Tel. 01-837 1234.

Index

Appointments vacant:
Universities
Fellowships and Studentships

Polytechnics
Technical Colleges
Colleges and Institutes of
Technology
Colleges with Teacher
Education
Colleges of Further
Education
Colleges and Institutes of
Higher Education
Colleges and Departments of
Art
Research Posts
Administration

Overseas
Adult Education
Librarians
General Vacancies
Official Appointments
Appointments wanted:
Other Classifications:
Awards
Exhibitions
Personal
Courses
Conferences and Seminars
Holidays and Accommodation

Rates:
Classified Display - £8.25 psc
Minimum size: 9cm x 1 col
@ £74.25
Classified Linage - £1.60 per
line
Minimum 3 lines - @ £4.80
Box number - £2.00
Copy deadlines:
Classified Display:
Friday in the week prior to
publication
Classified Linage:
Monday 10.00 am in the week
of publication

Universities



Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

The University of Sydney
CHAIR OF ACCOUNTING
Applications are invited for a Chair of Accounting which will become vacant on the retirement of Professor J. J. Cullen in December 1982. The holder of the Chair will be responsible for the teaching and supervision of the Accounting Department. The holder will also be responsible for the development of the Department's research programme in accounting. The holder will be expected to contribute to the University's research programme in accounting. The holder will be expected to contribute to the University's research programme in accounting. The holder will be expected to contribute to the University's research programme in accounting.

The University of Tasmania
LECTURER IN INFORMATION SCIENCE
Applications are invited for appointment to the above position on a full-time basis. The holder of the post will be responsible for the teaching and supervision of the Information Science Department. The holder will also be responsible for the development of the Department's research programme in information science. The holder will be expected to contribute to the University's research programme in information science. The holder will be expected to contribute to the University's research programme in information science.

Deakin University, Geelong
LECTURER - MARKETING
The Marketing Department of the School of Management is seeking an off-campus Lecturer in Marketing. The holder of the post will be responsible for the teaching and supervision of the Marketing Department. The holder will also be responsible for the development of the Department's research programme in marketing. The holder will be expected to contribute to the University's research programme in marketing. The holder will be expected to contribute to the University's research programme in marketing.

PARA NEW GUINEA
INSTITUTE OF APPLIED SOCIAL AND ECONOMIC RESEARCH
The Papua New Guinea Institute of Applied Social and Economic Research was established in January 1976 to promote research into the Papua New Guinea society and economy and undertake research into social, political and economic problems in order to provide practical solutions to these problems. The Institute is now seeking applications from political scientists, for the position of:

RESEARCH FELLOW/SENIOR RESEARCH FELLOW IN POLITICAL SCIENCE
The Institute is seeking applications from political scientists, for the position of: Research Fellow/Senior Research Fellow in Political Science. The holder of the post will be responsible for the teaching and supervision of the Political Science Department. The holder will also be responsible for the development of the Department's research programme in political science. The holder will be expected to contribute to the University's research programme in political science. The holder will be expected to contribute to the University's research programme in political science.

The Australian National University
POSTDOCTORAL FELLOW/RESEARCH FELLOW
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

Research Fellow/Senior Research Fellow
The Department of Social Sciences is seeking applications from social scientists, for the position of: Research Fellow/Senior Research Fellow. The holder of the post will be responsible for the teaching and supervision of the Social Sciences Department. The holder will also be responsible for the development of the Department's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences.

Research Fellow/Senior Research Fellow
The Department of Social Sciences is seeking applications from social scientists, for the position of: Research Fellow/Senior Research Fellow. The holder of the post will be responsible for the teaching and supervision of the Social Sciences Department. The holder will also be responsible for the development of the Department's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences.

Research Fellow/Senior Research Fellow
The Department of Social Sciences is seeking applications from social scientists, for the position of: Research Fellow/Senior Research Fellow. The holder of the post will be responsible for the teaching and supervision of the Social Sciences Department. The holder will also be responsible for the development of the Department's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences.

Research Fellow/Senior Research Fellow
The Department of Social Sciences is seeking applications from social scientists, for the position of: Research Fellow/Senior Research Fellow. The holder of the post will be responsible for the teaching and supervision of the Social Sciences Department. The holder will also be responsible for the development of the Department's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences.

Research Fellow/Senior Research Fellow
The Department of Social Sciences is seeking applications from social scientists, for the position of: Research Fellow/Senior Research Fellow. The holder of the post will be responsible for the teaching and supervision of the Social Sciences Department. The holder will also be responsible for the development of the Department's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences.

UNIVERSITY OF ZIMBABWE
Applications are invited for the following posts -
Academic
Lectureship/Senior Lectureship in the Department of Geology
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

Lectureship/Senior Lectureship in the Department of Law
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

Lectureship/Senior Lectureship in the Department of Pharmacy
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

Research Fellow/Senior Research Fellow
The Department of Social Sciences is seeking applications from social scientists, for the position of: Research Fellow/Senior Research Fellow. The holder of the post will be responsible for the teaching and supervision of the Social Sciences Department. The holder will also be responsible for the development of the Department's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences.

Research Fellow/Senior Research Fellow
The Department of Social Sciences is seeking applications from social scientists, for the position of: Research Fellow/Senior Research Fellow. The holder of the post will be responsible for the teaching and supervision of the Social Sciences Department. The holder will also be responsible for the development of the Department's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences.

Research Fellow/Senior Research Fellow
The Department of Social Sciences is seeking applications from social scientists, for the position of: Research Fellow/Senior Research Fellow. The holder of the post will be responsible for the teaching and supervision of the Social Sciences Department. The holder will also be responsible for the development of the Department's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences. The holder will be expected to contribute to the University's research programme in social sciences.

UNIVERSITY OF THE WEST INDIES
JAMAICA
Applications are invited for the following posts in the Faculty of Natural Sciences:

1. Lecturer/Assistant Lecturer in Chemistry
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

2. Lecturer/Assistant Lecturer in Mathematics (2 posts)
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

UNIVERSITY OF THE WEST INDIES
TRINIDAD
Applications are invited for the post of:

SENIOR LECTURER/LECTURER
In Petroleum Engineering
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

UNIVERSITY OF THE WEST INDIES
TRINIDAD
Applications are invited for the post of:

SENIOR LECTURER/LECTURER
In Petroleum Engineering
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

UNIVERSITY OF THE WEST INDIES
TRINIDAD
Applications are invited for the post of:

SENIOR LECTURER/LECTURER
In Petroleum Engineering
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

UNIVERSITY OF PAPUA
NEW GUINEA
Applications are invited for the post of:

SENIOR TUTOR/TUTOR
In the History of Science & Technology
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

HONG KONG
UNIVERSITY OF
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

LONDON
UNIVERSITY OF
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

OXFORD
UNIVERSITY OF
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

NEW ZEALAND
UNIVERSITY OF
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

NOTTINGHAM
UNIVERSITY OF
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

OXFORD
UNIVERSITY OF
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

Universities continued

The University of Bophuthatswana is a multi-campus system incorporating all tertiary education in the country. The major campus is situated at the capital city Mmabatho while a second campus at Taung houses the College of Agriculture. A third campus for Teacher's training and Technical careers is in the planning stages. The Mmabatho campus consists of the Schools of Education, Law, Administration and Management, Health and Social Sciences.

Rector and Vice-Chancellor
The First Rector and Vice Chancellor, Dr J. R. Kriel recently informed Council of his wish to return to his profession after his term of office expires in August 1982. Applications are therefore invited for the post of

The post presents a challenging opportunity for innovative leadership in the tertiary sector of a developing education system. The system is being developed on the basis of the Report of The National Education Commission, which called for the university to give priority to the development needs of the community.

It is hoped that the new Rector will be able to assume office by 1 July 1982. The duration of the Rector's initial contract will be negotiable between 3 and 5 years and the contract may be renewed. The salary is negotiable and will fall within the range applicable in the universities in neighbouring countries.

Applications should be addressed to The Chairman, University of Bophuthatswana, Private Bag X2046, Mafikeng, Bophuthatswana, Southern Africa, and should reach him on or before 20 November 1981.

University of Bophuthatswana
The University of Bophuthatswana is a multi-campus system incorporating all tertiary education in the country. The major campus is situated at the capital city Mmabatho while a second campus at Taung houses the College of Agriculture. A third campus for Teacher's training and Technical careers is in the planning stages. The Mmabatho campus consists of the Schools of Education, Law, Administration and Management, Health and Social Sciences.

NEW ZEALAND
DUNEDIN
UNIVERSITY OF OTAGO
DEPARTMENT OF ECONOMICS
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

NEW ZEALAND
UNIVERSITY OF WAIKATO
Hamilton
JUNIOR LECTURER/LECTURER IN POLITICAL SCIENCE
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

NOTTINGHAM
UNIVERSITY OF
Department of Music
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

OXFORD
UNIVERSITY OF
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

Polytechnics

SINGAPORE POLYTECHNIC THE INSTITUTION

The Singapore Polytechnic is a premier government institution responsible for the training of technical engineers. Financed by the Singapore Government the current annual operating budget for the institution is S\$27.3 million. It has a student enrolment of 8,500 (including a part-time enrolment of 3,500 students) and a full-time academic staff strength of 400. The medium of instruction is English.

Applications are invited from suitably qualified persons for appointment in the following positions:

- (A) **Civil Eng. & Building Dept.**
A degree or professional qualification in Architecture, Civil Engineering, Building, Quantity Surveying or Land Surveying.
- (B) **Electrical Eng. Dept.**
A degree or professional qualification in Electrical Engineering.
- (C) **Electronics & Communication Eng. Dept.**
A degree or professional qualification in Electronic Engineering with special emphasis in the fields of Communication Engineering, Digital Instrumentation & Control and Computer Engineering.
- (D) **Mechanical & Production Eng. Dept.**
A degree or professional qualification in Mechanical Engineering; Production Engineering; Metallurgical Engineering. Preference will be given to those with ability to teach tool and die design, machine tool manufacturing, heat treatment and foundry technology, plant maintenance engineering, instrumentation and control engineering, design and industrial automation.
- (E) **Chemical Process Technology Divn.**
A degree or professional qualification in Chemical Engineering, Polymer Technology or Food Technology.
- (F) **Maths & Computer Centre**
A degree in Computer Science.
- (G) **Marine Eng Dept.**
A degree in Marine Engineering or First Class Engineer Certificate of Competency (Steam or Motor).
- (H) **Nautical Studies Dept.**
(i) Extra Master or Master Foreign Going; BSc (Nautical Studies), Membership of the Chartered Institute of Transport.
(ii) Diploma in Marine Electronics, DOT Radar Maintenance and MRGC (or ROGC) Certificate or BSc (Electrical/Electronics).

TERMS & CONDITIONS OF SERVICE
Singaporeans and Malaysians will be offered appointment on local terms. Other expatriates will be appointed on contracts of 2 or 3 years' duration. Vacation leave and subsidised medical/dental benefits are provided. Under the Singapore Central Provident Fund Scheme, a staff member contributes at the current rate of 22% of his gross salary subject to a maximum of S\$850 per month and the institution contributes 20% of his gross salary towards the Fund. The sum standing to the staff member's credit in the fund is tax free and may be withdrawn when he leaves Singapore/Malaysia permanently. In addition to the above, a contract officer will receive free air passages for himself, his spouse and up to 3 children under 18 years of age; baggage allowance; children's education allowance; accommodation at subsidised rates.

INCOME TAX
The average effective tax rate paid by staff as a percentage of their net taxable income is as follows:

Principal Lecturer	20 - 24%
Senior Lecturer	15 - 17%
Lecturer	9 - 16%

APPLICATIONS
Interested persons should write to:
Assistant Registrar (Personnel)
Singapore Polytechnic
c/o Singapore High Commission
5 Cheesman Street, London S.W.1, United Kingdom.
(Tel: 01-235 9067/8/9)
giving their curriculum vitae, subjects they are able to teach, names and addresses of two referees. The closing date for receipt of applications is 27 November 1981.

LONDON
MIDDLESEX POLYTECHNIC
Lecturer
In Accounting and Finance
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

ROBERT GORDON'S INSTITUTE OF TECHNOLOGY, ABERDEEN
HEAD OF DESIGN
The Head of Design will be responsible for the teaching and supervision of the Design Department. The holder will also be responsible for the development of the Department's research programme in design. The holder will be expected to contribute to the University's research programme in design. The holder will be expected to contribute to the University's research programme in design.

LEICESTER
POLYTECHNIC
SCHOOL OF PHARMACY
PRINCIPAL LECTURER/SENIOR LECTURER IN MEDICAL LABORATORY SCIENCES
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

OXFORD
POLYTECHNIC
ADMINISTRATIVE
Applications are invited for the following posts, for which applications close on the dates shown. Salaries are indicated where appropriate. For further details, contact the relevant institution.

Overseas

HONGKONG POLYTECHNIC

The Hong Kong Polytechnic is a large institution of advanced education which offers courses in a wide range of subjects. In addition to four major academic Divisions comprising 17 teaching departments, it also has a number of inter-disciplinary institutes and centres. For the academic triennium 1981-84, emphasis will be placed on developing high level programmes and applied research activities relevant to the needs of Hong Kong. It is also envisaged that a number of vocationally-orientated degree programmes will be introduced in this triennium.

Applications are invited for the following posts tenable from September 1982:

DEPARTMENT OF ACCOUNTANCY

Principal Lecturers in Financial Management and Auditing & Investigations Senior Lecturers in Advanced Financial Accounting and Management Accounting Lecturers in Financial Accounting and Cost Accounting.

DEPARTMENT OF APPLIED SCIENCE

Principal Lecturers in Materials Technology; Senior Lecturers/Lecturers in Physiology/Animal Technology, Food Science/Microbiology, Ecology/General Biology, Food Technology, Chemical Engineering, Organic/Inorganic Chemistry and General Chemistry.

DEPARTMENT OF BUILDING & SURVEYING

Principal Lecturers/Senior Lecturers/Lecturers in Building Services; Principal Lecturers/Senior Lecturers in Quality Surveying and General Practice Surveying; Senior Lecturers in Land Surveying and Building Management; Senior Lecturers/Lecturers in Building Technology.

DEPARTMENT OF BUSINESS & MANAGEMENT STUDIES

Senior Lecturers/Lecturers in Marketing, International Marketing, Company Law, Commercial Law, Building Law, Purchasing and Supply Lecturers in General Principles of Law, Management Organisation, Behavioural Aspects of Organisation, Personnel Management and Industrial Relations, Insurance subjects, Economics, Monetary Theory and Practice.

DEPARTMENT OF CIVIL & STRUCTURAL ENGINEERING

Senior Lecturers/Lecturers in Civil Engineering Construction, Structural Design, Transportation Engineering, Coastal and Offshore Engineering.

DEPARTMENT OF COMPUTING STUDIES

Principal Lecturers/Senior Lecturers/Lecturers in Design of Real-time Systems, Computer Aided Design & Graphics, Systems Programming, Installation Management, Management Information Systems, Systems Analysis and Design, Applications Programming, Computer Systems, Data Base Management, Computer Applications in Areas relevant to the Polytechnic including Engineering, Mathematics, Accountancy, Business Studies, Textiles, Applied Design and Design.

DEPARTMENT OF ELECTRICAL ENGINEERING

Senior Lecturers/Lecturers in Power Electronics, High Voltage Engineering, Measurements, Electrical Machines, Installation, Advanced Circuits and Fields.

DEPARTMENT OF ELECTRONIC ENGINEERING

Principal Lecturers/Senior Lecturers/Lecturers in Communication Systems, Digital Signal Processing, Design/Application & Fabrication of Integrated Circuits, Electronic Manufacturing, CAD/CAM as applied to Electronic Engineering, Computer Systems, Software Engineering, Data Communication, Radio & Television Engineering, Control and Instrumentation.

DEPARTMENT OF INSTITUTIONAL MANAGEMENT & CATERING STUDIES

Principal Lecturers/Senior Lecturers in Applied Catering Management, Lecturers in Food & Beverage Service, Food Processing & Production, Applied Control and Accommodation Management.

DEPARTMENT OF LANGUAGES

Lecturers/Assistant Lecturers in Japanese.

DEPARTMENT OF MATHEMATICAL STUDIES

Principal Lecturers/Senior Lecturers in Mathematical Education or Computational Methods.

DEPARTMENT OF MECHANICAL & MARINE ENGINEERING

Senior Lecturers in Air-Conditioning, Heat Transfer, Mechanics of Machines, Aircraft Engineering, Senior Lecturers/Lecturers in Mechanical Engineering, Marine Engineering.

DEPARTMENT OF NAUTICAL STUDIES

Principal Lecturers/Senior Lecturers/Lecturers in Marine Electrical/Electrical Installation and Maintenance, Senior Lecturers/Lecturers in Ship Construction and Stability, Tankship Operations and Safety, Marine Environmental Studies, Maritime Law and Administration, Marine Radio-Communication and General Nautical subjects — Preparation Courses for Masters' and Mates' Examinations, Workshop Teacher in General Seamanship, Lifeboats Survival at Sea and Morse and Morse Procedure.

DEPARTMENT OF PRODUCTION & INDUSTRIAL ENGINEERING

Senior Lecturers/Lecturers in Production Technology, Production Management, Machine Tools and Manufacturing Technology, Industrial Management, Work Study, and Analysis of Manufacturing Systems.

SCHOOL OF SOCIAL WORK

Lecturers in Sociology and Social Work (Practical Training).

SWIRE SCHOOL OF DESIGN

Principal Lecturers/Senior Lecturers/Lecturers in Production/Industrial Design, Printed/Knitted Textile Design, Fashion Design, Interior/Furniture Design and Design Methodology/Design Management, Senior Lecturers/Lecturers in Design History,

Illustration, Drawing, Design Philosophy, Advertising, Photography, Foundation/Basic Design, Wood, Metals and Plastics Crafts and Typography, Lecturers in Printing Technology, Surface Pattern, General Graphics/Artwork, Western Lettering and Ergonomics.

INSTITUTE OF MEDICAL & HEALTH CARE

Principal Lecturers/Senior Lecturers/Lecturers in Medical Laboratory Sciences, Senior Lecturers/Lecturers in Occupational Therapy, Nursing Studies, Physiotherapy, Psychology and Diagnostic Radiography, Lecturers in Dental Technology.

INSTITUTE OF TEXTILES & CLOTHING

Principal Lecturers/Senior Lecturers/Lecturers/Assistant Lecturers in Clothing Technology and Clothing Production, Senior Lecturers/Lecturers/Assistant Lecturers in Fashion Design.

CENTRE OF ENVIRONMENTAL STUDIES

Senior Lecturers in Noise & Vibration Studies and Water Pollution Studies/Solid wastes Control Studies, Senior Lecturers/Lecturers in Air Pollution Studies.

Industrial Centre
Senior Manager (Training) (Principal Lecturer equivalent)

QUALIFICATIONS FOR APPOINTMENT AND SALARIES

Principal Lecturer: HK\$163,080-HK\$215,880 p.a.
Candidates should have (a) a degree or professional qualification and an advanced specialist qualification or extensive experience in a specialised field; (b) substantial professional experience; and (c) proven administrative ability.

Senior Lecturer: HK\$128,080-HK\$181,800 p.a.
Candidates should have (a) a degree or professional qualification and preferably an advanced specialist qualification; (b) substantial professional experience; and (c) proven administrative ability.

Lecturer: HK\$71,940-HK\$120,180 p.a.
Candidates should have (a) a degree or professional qualification, or in some cases, at least a Higher Technical qualification; and (b) at least three years professional experience.

Assistant Lecturer: HK\$60,880-HK\$88,640 p.a.
This is mainly a training grade. Candidates should have (a) a degree or equivalent professional qualification or (b) a Higher Technician qualification in the appropriate field of study and one year relevant experience.

Workshop Teacher: HK\$55,800-HK\$108,780 p.a.
Candidates should have either (a) a Hong Kong Polytechnic Higher Diploma/Certificate or equivalent PLUS five years relevant post-qualification industrial and/or teaching experience; OR (b) a post-qualification industrial and/or teaching experience PLUS seven years relevant industrial and/or teaching experience PLUS one year's approved full-time technical teacher training.

Note: £1 = HK\$10.63 pn 6th November 1981.

CONDITIONS OF SERVICE

Appointment will be on two-year gratuity-bearing contract terms initially. Thereafter suitable appointments may be offered contracts or superannuable terms of service at the discretion of the Polytechnic. Benefits include long leave; subsidised accommodation for overseas appointees and local appointees on a salary of HK\$10,015 p.m. or above; medical and dental benefits; children's education allowance and a terminal gratuity of 25% of basic salary received over entire contract period.

Further information and application forms are obtainable from the Hong Kong Government Office, 6 Grafton Street, London W1X 3LB, UK. Completed application forms should be returned to the same office by 6th December 1981.

NATIONAL UNIVERSITY OF SINGAPORE FACULTY OF MEDICINE

Applications are invited for teaching appointments in the following departments:
Anatomy
Physiology
Pharmacology
Social Medicine and Public Health
Obstetrics and Gynaecology

Candidates must possess relevant higher professional/academic qualifications. Preference will be given to those candidates who are medically-qualified.

Grade remuneration range as follows:

Lecturer: S\$20,000 - 40,000
Senior Lecturer: S\$40,000 - 70,000
Associate Professor: S\$60,000 - 80,000
(ET = S\$3,781)

The commencing salary is dependent upon the candidate's qualifications, experience, and the level of appointment offered. In addition, appointees will be entitled to a basic medical degree and higher professional/academic qualifications relevant to the discipline in which they are teaching will be given the option either to retain their existing salary or to be given a fixed allowance, the rates of which are as follows:

Lecturer: S\$ 400 - 500 p.a.
Senior Lecturer: S\$ 900 p.a.
Associate Professor: S\$1500 p.a.

Staff may be considered for tenure on fixed terms after the 1st 3-year contract or superannuable terms of service. Under the University's Academic Leave and Medical Leave Scheme, the staff member continues at 25% of the President Fund Scheme, the staff member continues at 50% of the staff member's monthly gross salary. The sum awarded to the staff member's credit in the Fund may be withdrawn when the leave period ends. Malaysia permanently benefits under a staff's salary of S\$120,000 maximum of S\$120,000 p.a., subsidised housing (rental) of S\$120,000 p.a., and a 5-year contract. Further information and application forms are obtainable from either:

Application forms and further information may be obtained from either:
Director
NUS Overseas Office
8 Orchard Street
Singapore 0511

The Head, Recruitment Unit
National University of Singapore
Singapore 0511

All applications should be submitted to the Recruitment Unit.

THES12

Overseas continued



KURING-GAI COLLEGE OF ADVANCED EDUCATION SYDNEY, N.S.W. AUSTRALIA INTERNATIONAL VISITING FELLOW COMMUNICATIONS STUDIES

Kuring-Gai College of Advanced Education is a multi-disciplinary institution of higher education situated in the northern Sydney suburb of Lindfield. The College is of outstanding modern architecture and is surrounded by 22 hectares of natural bushland overlooking the Lane Cove River. The College employs approximately 350 staff and has a student enrolment of 3,200.

The Department of Communication Studies currently teaches a range of undergraduate and graduate courses within programmes offered by the Schools of Financial and Administrative Studies, Library and Information Studies, Practical Legal Training, Teacher Education and Recreation and Community Studies. The task of the International Visiting Fellow will be to assist with the design and delivery of coursework in Communication Studies and to be involved in consultation concerning the role of Communication Studies in the College's teaching programme.

The appointee will teach in undergraduate courses in interpersonal communication and argumentation and/or courses in small group communication, organizational communication, mass communication, theory and research in communication, and media management as appropriate.

Applicants must possess a strong disciplinary background, evidenced by higher degree qualifications in communication and by activity in research and publication. Considerable experience in tertiary teaching and in course development is also essential.

It is envisaged the appointment will commence at the beginning of the Second Semester (July 1982). A contract for a period of 12 months will be offered to the successful applicant. Round trip air fares for an overseas appointee and his or her dependants will be met.

The appointment will be made within one of the following salary ranges:

Lecturer: \$A17,083-\$A26,038 p.a.
Senior Lecturer: \$A26,593-\$A30,594 p.a.
Principal Lecturer: \$A32,414-\$A35,048 p.a.

Initial enquiries regarding this position should be directed by email to Dr. Harry Irwin, Head, Department of Communication Studies.

Applications in writing giving personal details, details of qualifications and experience and the names and addresses of two referees should be forwarded to: The Secretary, Kuring-Gai College of Advanced Education, P.O. Box 222, Lindfield, N.S.W. 2070, by 31st January, 1982.

Federal University of Technology MAKURDI, NIGERIA

The Federal University of Technology at Makurdi has immediate openings at several levels ranging from Graduate Assistant to Professor in the following disciplines:-

- Computer Science
- Mathematics
- Management
- Engineering Science

In addition the University is seeking:
— Librarians
— Physical Planners

These openings offer the opportunity to be at the forefront of the development of a new university which aims primarily at the education of graduates entering agriculture, agriculture products and processes, and productive industry in general.

Candidates for these posts will be expected to have the usual academic qualifications together with teaching and industrial experience. Salaries will be on Nigerian Scales together with attractive enhancements for holders of foreign degrees.

The Polytechnic of Central London is contracted by the University to fill these posts as quickly as possible and interested applicants can make informal, preliminary enquiries through Professor R. K. Penny as follows:

School of Engineering and Sciences, Polytechnic of Central London, 115 New Cavendish Street, London W1.

Telephone: (01) 495 8811 ext. 6293 or 6294 (During 09.00-17.00 or 19.30 on 011 92101 or 011 92101).

Note: (0332) corresponds to the Standard Code for Byeloss.

THES12

UNIVERSITY OF NATAL DEPARTMENT OF PSYCHOLOGY, PIETERMARITZBURG

Applications are invited from suitably qualified persons regardless of sex, religion, race, colour or national origin for appointment to the post of

PROFESSOR AND HEAD OF THE DEPARTMENT OF PSYCHOLOGY

Applicants should have a good grounding in general psychology. At present, the Department of Psychology has a staff of 12, of whom 10 are full-time. The Department is also a major interest in basic psychology.

The salary will be in the range: R20 040-R26 250

The commencing salary will be dependent on the qualifications and/or experience of the successful applicant. In addition, an annual vacation service bonus equivalent to 3% of one month's salary is payable, subject to Treasury Regulations.

Application forms, further particulars of the post and information on pension, medical aid, group insurance, housing loan and subsidy allowances, conditions of service, and travelling expenses on first appointment should be sent to: The Registrar, University of Natal, Pietermaritzburg, P.O. Box 1700, Pietermaritzburg, Natal 6001, South Africa. Tel: 031 274 1111. Applications should be sent to the Registrar by 10th January 1982, quoting reference number PMS 7981.

Educational Posts Overseas.

KENYA

Senior Lecturer in
Agricultural Economics
Senior Lecturer in
Water Engineering
Kenya Institute of Public
Administration (KIPA)

Reference: 61 A 76-77

The KIPA is a large well-established administrative training centre of the Government of Kenya with a staff of over 80 training up to 600 public officials at any one time in a wide variety of fields. Under a programme assisted by World Bank funds they are developing the Department of Research in the field of Project Management, particularly those projects concerned with agriculture and rural development.

The Job:

81 A 80 — Senior Lecturer in Agricultural Economics: To teach Agricultural Economic.

Project Development and Management, rural planning, cost benefit, analysis and operational research with up to 10 teaching hours per week.
81 A 81 — Senior Lecturer in Water Engineering: To teach Water Project Management, and planning and implementation of water projects in rural areas.

Both Jobs: To organise research projects, undertake field trips, develop curriculum and course studying material, and co-ordinate various departmental activities as requested, and normal academic responsibilities.

Qualifications: Candidates should be over 35 and have at least five years relevant experience in training and research, preferably in Africa, and would normally be required to have an appropriate second degree.

Salary and Benefits: K24,000 and K26,000 p.a. tax free, one year contract with 20% terminal grant, education allowance, rent allowance, interest free car loan, free medical scheme, transport allowance, baggage allowance.
Starting Date: January 1982.

Please write briefly stating qualifications and length of appropriate experience quoting relevant reference number and title of post for details and application forms to: Overseas Educational Appointments Department, The British Council, 66 Davies Street, London W1Y 2AA.

THES12

THE NATIONAL EYE CENTRE

(National Institute of Ophthalmology)

KADUNA, NIGERIA

Applications are invited from suitably qualified candidates, resident in UK or Europe for the post of ACADEMIC AND PLANNING SECRETARY who will be accountable directly to the Director of the Centre.

Qualifications: Candidates should possess a good University Degree in any of the following disciplines: Humanities, Law or Social Sciences. In addition he should have a post qualification administrative experience of at least ten years in a senior administrative position in a University or similar institution.

Duties: The successful candidate will be responsible to the Director of the National Eye Centre for the planning of the Ophthalmic Postgraduate Medical School which is the Academic Division of the National Eye Centre and for the administration of the School when it becomes operational.

He will also be concerned with the development programme of the National Eye Centre based on a master plan which will soon be ready for implementation. He will liaise with the associated Ophthalmic Teaching Hospital, Federal Universities with Medical Schools and the appropriate Federal and State Ministries.

The first intake of postgraduate students in the Medical School will take place in 1983.

Salary: N1,588-N12,720 per annum (at present under review). (£1 = 1.25 Naira).

Conditions of Service: The contract will be for two years initially. The appointee is entitled to contract addition of 25% of his basic salary, part-furnished residential accommodation at rental not exceeding N300 per annum or housing allowance in lieu, air passages for himself and family (wife and up to five children not above 18 years of age) on appointment, approved overseas leave/termination. Four weeks paid leave per year with a further four weeks paid leave on completion, free medical/dental service, an official car or a transport allowance.

Method of Application: Six typewritten copies of curriculum vitae stating full name, date and place of birth, current postal address and telephone number, nationality, marital status, number and ages of children, academic and professional qualifications with institutions and dates, post held and dates, date of availability if found appointable, names and addresses of three referees.

Applicants should request their referees to forward confidential reports to: The Director, Nigerian Universities Office, 180 Tottenham Court Road, London W1P 8LE, to whom applications should be sent not later than 15th December, 1981, and from whom further information may be obtained, or: The Director, The National Eye Centre, P.O. Box 81581, Ikoru, Lagos, Nigeria.

THES12

UNIVERSITY OF NATAL, BUSINESS DATA PROCESSING FACULTY OF COMMERCE, DURBAN

Applications are invited from suitably qualified persons, regardless of sex, religion, race, colour or national origin for appointment to the post of

SENIOR LECTURER IN BUSINESS DATA PROCESSING

Salary in the range: R14 370-R20 850 per annum

The commencing salary will be dependent on the qualifications and/or experience of the successful applicant. In addition, a service bonus of 5% of one month's salary is payable, subject to Treasury Regulations.

Application forms, further particulars of the post and information on pension, medical aid, group insurance, housing loan and subsidy allowances, conditions of service, and travelling expenses on first appointment should be sent to: The Registrar, University of Natal, Pietermaritzburg, P.O. Box 1700, Pietermaritzburg, Natal 6001, South Africa. Tel: 031 274 1111. Applications should be sent to the Registrar by 10th January 1982, quoting reference number PMS 7981.

THES12

UNIVERSITY OF NATAL

Finance Division — Durban

Applications are invited from suitably qualified persons regardless of sex, religion, race, colour or national origin for appointment to the post of:

Assistant Finance Officer

Salary in the range:

R17 940-R25 550 per annum

The commencing salary will be dependent on the qualifications and/or experience of the successful applicant. In addition, a service bonus of 5% of one month's salary is payable, subject to Treasury Regulations.

Application forms, and conditions of service, including details of fringe benefits and further particulars relating to the vacancy are obtainable from the Registrar, University of Natal, King George V Avenue, Durban.

Natal, South Africa, 4001, or The Secretary, South African Universities Office, Chichester House, 278 High Holborn, London WC1V 7HE, with whom applications, on the prescribed form must be lodged not later than 10th January 1982, quoting reference number D11681.

THES12

Awards

COVENTRY

FELOWSHIP FOR
VENETIAN RESEARCH

The trustees of the GLADYS KUBLER DELMAN FOUNDATION of New York announce that a fellowship of £10,000 will be made available in 1982-83 to scholars of Great Britain and the Commonwealth for research in Venice.

The areas of interest envisaged concern both the past (history, art, architecture, music, law, science, literature, language) and the present (politics, education, environment) of Venice and the territories over which it has ruled. Further particulars may be obtained from the Secretary to the Foundation's advisory committee, Department of History, University of Warwick, Coventry, CV4 7AL, to whom enquiries should be sent not later than 15 January 1982.

THES12

REMINDER

COPY FOR
ADVERTISEMENTS IN THE
THIS SHOULD ARRIVE
NOT LATER THAN 10A.M.
MONDAY PRECEDING
THE DATE OF
PUBLICATION

CLASSIFIED ADVERTISEMENTS

To
Advertise
in the

THE
SHEPHERD

phone
JOHN
CLARK

on
01-837

1234

x7526

THE
TIMES
HIGHER
EDUCATION
SUPPLEMENT

P.O. BOX 7
GRAYS INN
ROAD
LONDON
WC1X
8EZ

Mining Engineering

University of Petroleum & Minerals
Dhahran, Saudi Arabia

The Department of Petroleum Engineering (mining engineering option) will have faculty positions open for the academic years 1981-82 (second semester, starting 20 February, 1982) and 1982-83 (starting 1 September 1982).

Academic Qualifications and Experience:

PhD degree — with teaching and practical experience. Undergraduate mining courses include rock mechanics, surface and underground mining methods, mine plant design, mine economics and feasibility studies, mineral processing and extractive metallurgy, and mine surveying. Language of instruction is English.

Minimum regular contract for two years, renewable. Competitive salaries and allowances. Air conditioned and furnished housing provided. Free

air transportation to and from Dhahran each year. Attractive educational assistance grants for school-age dependent children. All earned income without Saudi taxes. Ten months duty each year with two months vacation with salary. There is also possibility of selection for University's ongoing summer programme with good additional compensation.

Apply with complete resume on academic, professional and personal data, list of references, publications and research details, and with copies of degrees and/or transcripts, including home and office addresses and telephone numbers to:

Dean of Faculty & Personnel Affairs, University of Petroleum & Minerals, P.O. Box 144, Dhahran International Airport, Dhahran, Saudi Arabia.

THES12

